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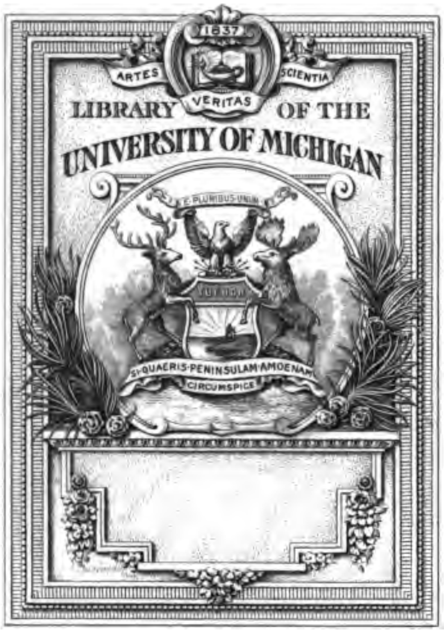
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ANNUAL REPORT

OF THE

WISCONSIN

State Horticultural Society

FOR THE YEAR 1905.

VOL. XXXV

F. CRANEFIELD, Secretary,
MADISON, WIS.

MADISON, WIS.
DEMOCRAT PRINTING CO., STATE PRINTER.
1905.

LETTER OF TRANSMITTAL.

MADISON, Wis., March 10, 1905.

To His Excellency, ROBERT M. LAFOLLETTE,
Governor of Wisconsin.

DEAR SIR:—I have the honor to transmit to you herewith the Thirty-fifth Annual Report of the Wisconsin State Horticultural Society.

Respectfully,
FREDERIC CRANEFIELD,
Secretary.

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LAWS RELATING TO THE WISCONSIN STATE HORTICULTURAL SOCIETY.

EXTRACT FROM CHAPTER 526, LAWS OF 1889.

Section 5. And further, there shall be printed annually upon the approval and order of the commissioners of public printing, * * * seven thousand copies of the transactions of the Wisconsin State Horticultural Society, the same to embrace such abstracts of reports of county and other horticultural societies, and such matters pertaining to the horticultural interests of the state as shall be deemed important, provided that the whole number of printed pages shall not exceed two hundred. * * * Two thousand copies of each of said reports to be bound separately in cloth, all others singly in paper.

Section 6. The reports provided for in the preceding section shall be distributed as follows, through the superintendent of public property: Fifteen copies to each member of the legislature, fifty copies to the State Horticultural Society, ten copies to each county agricultural society, and district industrial association, which embraces two or more counties and furnishes the State Agricultural Society a report of its proceedings, to each of the four societies named in the preceding section, fifty copies of each of the reports of the other three societies, twenty-five copies of each of the reports to the library of the state university; to the governor, lieutenant-governor, secretary of state, state treasurer, attorney general, state superintendent of public instruction, railroad commissioner and insurance commissioner, twenty-five copies each; to the state superintendent of agricultural institutes, fifty copies; to the superintendent of public property, commissionr of labor statistics, adjutant-general, quartermaster general, state board of health, each ten copies; to each public library in the state, two copies; to each state normal school, two copies; to each of the state charitable and penal institutions, one copy; and the remaining copies to the respective societies for distribution by their secretaries.

Section 7. In no case shall the number of printed pages in any report provided for in the act exceed the maximum number specified, except upon written request of the officers submitting the same, and then only upon previous written approval of a majority of the commissioners of public printing, such application and approval to be filed with the secretary of state.

EXECUTIVE COMMITTEE; SECRETARY'S REPORT.

Section 1459a, Statutes of 1898.

Section 1459a. The executive committee of said society shall consist of the president, secretary and treasurer thereof, ad one member from each congressional district in the state, these to be chosen annually by the county and local horticultural societies in the respective districts at such time and in such manner as the state society may prescribe. The executive committee may fix the time and place for holding the annual meeting of the state society, if the last meeting thereof failed to do so, and may call such meeting by giving at least thirty days' notice to each member; said committee may also fill all vacancies in the offices of the society, and if a member of such committee is not elected from any congressional district the vacancy may be filled by a vote of two-thirds of the members of the society present at any regularly appointed meeting. The secretary of the society shall make, in October of each even numbered year, a report to the governor of the transactions thereof, including an itemized account of all moneys expended since the last report was made.

No. 224, S.] [Published May 16, 1903.

CHAPTER 259.

AN ACT to amend section 1459 of the statutes of 1898 as amended by chapter 320 of the laws of 1901, relating to the state horticultural society and making an appropriation.

The people of the State of Wisconsin, represented in senate and assembly, do enact as follows:

Section 1. Section 1459 of the statutes of 1898 as amended by chapter 320 of the laws of 1901 is hereby amended by striking out the words "twenty-two hundred and fifty dollars" where the same appear in said section 1459 as amended, and by inserting in lieu thereof the words "four thousand dollars," so that said section when so amended shall read as follows: Section 1459. The Wisconsin state horticultural society is a body corporate by that name, with the general powers and privileges of a corporation so far as applicable. It shall be the duty of the society to aid in the formation and maintenance of county and local horticultural societies, to promote the horticultural interests of the state by holding meetings for discussion thereof, by the collection and dissemination of information in regard to the cultivation of fruits, flowers and trees adapted to the soil and climate of this state, and in other proper ways to advance the fruit and tree growing interests thereof; and for such purposes only it may take, hold and convey real and personal property, the former not exceeding five thousand dollars in value. For the purpose of aiding in the accomplishment of such subjects the society shall be entitled to receive four thousand dollars annually from the state treasury, two hundred and fifty dollars of which shall be for the maintenance of experiment stations.

Section 2. This act shall take effect and be in force from and after its passage and publication.

Approved May 14, 1903.

CONSTITUTION AND BY-LAWS.

NOTE.—At a meeting of the Executive Committee Feb. 6, 1905, the following motion prevailed: "That the President appoint a committee of three to revise the Constitution and By-Laws and to report on Friday (Feb. 10th), said revision when adopted by the Society to render null and void any motion, resolution or action previously enacted by the Society or Executive committee which may be contrary to the provisions of said revision as adopted."

The committee appointed reported the following revision which was adopted by the Socity.

CONSTITUTION.

Article I. This society shall be known as the Wisconsin State Horticultural Society.

Article II. Its object shall be the advancement of the art and science of horticulture throughout the state.

Article III. Its members shall consist of *annual* members, paying an annual fee of one dollar, which also shall entitle the wife of such member to the privileges of full membership; of *life* members paying a fee of five dollars at one time; of *honorary* members, who shall be distinguished for merit in horticultural and kindred sciences, or who shall confer any particular benefit upon the society, and *honorary annual* members who may by vote, be invited to participate in the proceedings of the society.

Article IV. Its officers shall consist of a President, Vice-President, Secretary, Treasurer, and an Executive Committee, consisting of the foregoing officers and additional members, one from each congressional district of the state, five of whim shall constitute a quorum at any of its meetings. All above officers, except Secretary, shall be elected by ballot, and shall hold office for one year thereafter, and until their successors are elected. The Secretary shall be appointed by the Executive Committee at the annual meeting, after the election of officers, and shall hold office for one year thereafter or until his successor is appointed.

Article V. The additional members of the Executive Committee may be elected by the local horticultural societies of their respective districts in the following manner: Each of the county or local societies of the different districts shall, at a regular meeting, elect a delegate who shall have authority to cast the vote of said society; these delegates shall meet in convention at least 15 days previous to date of annual meeting of this society and vote by ballot for member of Executive Committee; and if a member of such committee is not elected from any congressional district the vacancy may be filled by vote of two-thirds of the members present at the annual meeting.

Article VI. The terms "County and local horticultural societies" shall include any organization that shall have for its sole object the advancement of the interests of its members in the growing or sale of horticultural crops; provided, that such society acts by authority of a regularly adopted constitution and makes an annual report to the Secretary of the state society.

Article VII. The society shall hold its annual meeting for the election of officers, exhibition of fruits and discussions, in Madison, commencing on the first Tuesday of February of each year and such other meetings and at such time and place as the Executive Committee may direct.

Article VIII. The President, Treasurer, and Secretary shall constitute a Board of Managers which may conduct any business deemed necessary for the society in the absnce of the Executive Committee. All bills against the society must be audited by the Board of Managers before being paid.

Article IX. This constitution, with the accompanying by-laws, may be amended at any regular meeting by a two-thirds vote of the members present.

BY-LAWS.

I. The President shall preside at meetings, and, with the advice of the Secretary, call all meetings of the society, and have general supervision of the affairs of the society, and shall deliver an annual address upon some subject connected with horticulture.

II. The Vice-President shall act in the absence or disability of the President, and perform the duties of the chief officer.

III. The Secretary shall attend to all the correspondence, shall record the proceedings of the society, preserve all papers belonging to the same, and superintend the publication of its reports. He shall also present a detailed report of the affairs of the society at its annual meeting. He shall also endeavor to secure reports from the various committees, and from local societies of the condition and progress of horticulture in the various districts of the state, and report the same to the society. He shall also be Superintendent of all Trial Orchards. It shall be the duty of the Secretary to make a report to the governor of the state of the transactions of the society, according to the provisions of the statutes for state reports.

IV. The Superintendent of Trial Orchards shall supervise the planting and cultivation of the trial orchards and trial stations and shall exercise general control of the same, subject to the directions of the Trial Orchard Committee.

V. The Treasurer shall keep an account of all moneys belonging to the society and disburse the same on the written order of the President, countersigned by the Secretary, and shall make an annual report of the receipts and disbursements, and furnish the Secretary with a copy of the same on or before the first day of the annual meeting. The Treasurer elect shall, before entering upon the discharge of the duties of his office, give good and sufficient bonds for the faithful performance of his duties subject to the approval of the Executive Committee.

VI. The Executive Committee may manage all the affairs of the society and fill all vacancies in the board of officers; meetings of the committee may be called by the President, the Secretary or by the Secretary on written request of five members.

VII. Regular meetings of the Board of Managers shall be held bimonthly to audit accounts and transact other business; special meetings may be called by any member of the Board.

VIII. The standing committees of this society shall be as follows:

1st. Committee on Finance, consisting of three members.

2d. Committee on Nomenclature and New Fruits, consisting of three members.

3d. Committee on Trial Orchards and Trial Stations, consisting of three members, and such other committees as may be determined from time to time to be necessary. Said committees to be appointed annually by the President.

IX. It shall be the duty of the Finance Committee to settle with the Treasurer and to examine and report upon all bills or claims against the society which may have been presented and referred to them.

X. The Trial Orchard Committee shall have general control of the locating, planting and care of all trial orchards or trial stations, and shall visit collectively each orchard or station once each year or oftener if deemed necessary. Meetings of the committee may be called at any time by the President of the society or by the Superintendent of Trial Orchards.

MEMBERSHIP ROLL.

LIFE MEMBERS.

Ames, W. L.	Oregon, Wis.
Allis, Frank W.	Madison, Wis.
Babcock, O. W.	Omro, Wis.
Barnes, A. D.	Waupaca, Wis.
Bussey, W. P.	Omro, Wis.
Chappel, F. H.	Oregon, Wis.
Chandler, S. S. Jr.	Waupaca, Wis.
Cole, W. B.	Pleasant Prairie, Wis.
Converse, D. A.	Ft. Atkinson, Wis.
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Edwards, F. C.	Ft. Atkinson, Wis.
Eaton, B. A.	South Milwaukee, Wis.
Foley, M. F.	Baraboo, Wis.
France, N. E.	Platteville, Wis.
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Harden, F. A.	Weyauwega, Wis.
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Kellogg, M. S.	Janesville, Wis.
Kellogg, L. G.	Ripon, Wis.
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Simonson, Andrew	Racine, Wis.
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Toole, Wm.	Baraboo, Wis.
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Vaughn, B.	Grand Rapids, Wis.
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Peterson, P. A.	Poplar, Wis.
Peterson, Chas. A.	Orange, Wis.
Post, Lewis,	Madison, Wis.
Pride, C. A.	Milwaukeee, Wis.
Proudfit, A. E.	Madison, Wis.
Quinn, Michael	Lake Geneva, Wis.
Ramsey Mrs. Robt.	Baraboo, Wis.
Ray, Joseph	Madison, Wis.
Rayall, R. R.	Madison, Wis.
Redeling Henry	Marinette, Wis.
Reeve, Dr. J. S.	Appleton, Wis.
Reek, Joseph	Neenah, Wis.
Rentscheler Ceo.	Madison Wis.
Rentschler, Fred G.	Madison, Wis.
Reupke, Albert	Lake Geneva, Wis.
Riegle, G. W.	Madison, Wis.
Richardson, C. L.	Chippewa Falls.
Roddis, Mrs. W. H.	Marshfield, Wis.
Rietbrock, Fred.	Milwaukee, Wis.
Ruste, C. O.	Blue Mounds, Wis.
Rowe, Mrs. Nelson	Oshkosh, Wis.
Rosenow, Arthur	Oconomowoc, Wis.
Rosenow, Henry E.	Oconomowoc, Wis.
Rundell, B. L.	Livingstone, Wis.
Ryall, B. R.	Augusta, Wis.
Ryan, Sam J.	Appleton, Wis.
Sampson, Robt. J.	Lake Geneva, Wis.
Sandsten, Prof. E. P.	Madison, Wis.
Sandgren, Ed.	Lake Geneva, Wis.
Sandell, Harvey	Madison, Wis.
Sandegard, Chris.	Lake Geneva, Wis.
Saxe, Arthur	Whitewater, Wis.
Schilt, Peter	Lake Geneva, Wis.
Searing, A. J.	Ashland Jct. Wis.
Shephard, Geo.	Lake Geneva, Wis.
Skewes, E. B.	Union Grove, Wis.

Simonson, A. L.	Washburn, Wis.
Sidney, J. A.	Poplar, Wis.
Skinner, E. B.	Madison, Wis.
Slaby, E. G.	Madison, Wis.
Sligh, John	Lake Geneva, Wis.
Smith, Geo. B.	Green Bay, Wis.
Smith, Silas S.	Green Bay, Wis.
Smith, A. J.	Lake Geneva, Wis.
Smith, Irving	Green Bay, Wis.
Smith, B. H.	Tiffany, Wis.
Smith, Mrs. J. Q.	Madison, Wis.
Soblie, Jas.	Lake Geneva, Wis.
Sperbeck, M. V.	Oshkosh, Wis.
Spaulding, C. F.	Oconomowoc, Wis.
Spry, John	Ft. Atkinson, Wis.
Stark, Frank	Randolph, Wis.
Steensland, Halle	Madison Wis.
Sumner, Ed.	Madison, Wis.
Swartz, John F.	Kenosha, Wis.
Swenholt, Jonas	Shawano, Wis.
Tamblingson, R. A.	Ft. Atkinson, Wis.
Thompson, Robt. Jr.	Madison, Wis.
Thwaites, Mrs. R. G.	Madison, Wis.
Tifft, Geo. L.	Milwaukee.
Treleven, Jas. D.	Omro, Wis.
Trowbridge, Geo.	Lake Geneva, Wis.
Tuttle, H,. B.	Valley Jct., Wis.
Tiplady, John	Lake Geneva, Wis.
Turville, Thomas Jr.	Madison, Wis.
Turtle, Henry	Lake Geneva, Wis.
Topolinsky, John	Lake Geneva, Wis.
Tollman, Henry	Lake Geneva, Wis.
Updike, Rev. E. G.	Madison, Wis.
Utter, Delbert	Caldwell, Wis.
Umlauft, Rudolph	Dorchester, Wis.
Vivian, Fred	Mineral Point, Wis.
Voss, Heinrich	Watertown, Wis.
Wahlstead, Wm.	Lake Geneva, Wis.
Wallin, Austin	Madison, Wis.
Walker, Geo.	Sawyer, Wis.
West, John B.	Whitewater, Wis.
Weyerhorst, H. C.	Oshkosh, Wis.
Whittlesey, S. N.	Cranmoor, Wis.
Wilder, A. P.	Madison, Wis.
Wilkins, A. P.	Delavan, Wis.
Williamson, W. D.	Madison, Wis.

BUSINESS CARDS OF MEMBERS.

Adams, W. H., Eagle River, small fruits.
Barnes, A. D, Waupaca, nursery and fruit farm.
Bingham, D. E, Sturgeon Bay, nursery and fruit farm.
Brown, A. D., Baraboo, I. X. L. nursery.
Chappel, F. H., Oregon, nursery.
Coe, Converse & Edwards Co., Ft. Atkinson, nursery.
Foley, M. F., Baraboo, nursery.
Hager, W. S., West Depere, small fruits.
Hanchett, Wm., Sparta, small fruits.
Hatch, A. L., Sturgeon Bay, nursery and fruit farm.
Hatch, A. L, Sturgeon Bay, nursery and fruit farm.
Herbst, J. L., Sparta, small fruits.
Hotchkiss, H. B., Eau Claire, small fruits.
Johnson, Franklin, Baraboo, small fruits.
Jeffrey, Geo. J., Milwaukee, small fruits and orchard.
Kellogg, L. G., Ripon, nursery and small fruit.
Kellogg, Geo. J. & Sons, Janesville, nursery and fruit farm.
Loope, T. E., Eureka, nursery and small fruit.
Marshall, S. H., Madison, Maple Bluff Farm, cherries and native plums.
McKay Bros., Pardeeville, nursery.
Moyle, W. J., Union Grove, nursery.
Parsons, A. A., Omro, fruit farm.
Palmer, L. H., Baraboo, small fruits.
Pearson, C. L., Baraboo, small fruits.
Post, Lewis, Madison, small fruits.
Philips, A. J., West Salem, nursery and fruit farm.
Ray, Joseph, Madison, fruit farm.
Ramsey, Robt., Baraboo, fruit farm.
Richardson, C. L., Chippewa Falls, small fruits.
Rentschler, F., Madison, greenhouse.
Rentschler, Geo., Madison, greenhouse and nursery.
Smith Bros, Green Bay, market garden and small fruits.
Spry, John, Ft. Atkinson, small fruits.
Stark, Frank, Randolph, fruit farm.
Tamblingson & Son, Ft. Atkinson, nursery.
Toole, Wm, Baraboo, pansy specialist.
Underwood, J. M., Lake City, Minn., nursery.
Wilkins, A. P., Delavan, nursery.
Williamson, W. D., Madison, tree protectors.

OFFICERS AND COMMITTEES FOR 1905.

President, T. E. Loope	Eureka
Vice-President, Geo. J. Kellogg	Lake Mills
Secretary, F. Cranefield	Madison
Treasurer, L. G. Kellogg	Ripon

EXECUTIVE COMMITTEE.

T. E. Loope, Chairman	Ex-Officio
F. Cranefield	Ex-Officio
Geo. J. Kellogg	Ex-Officio
L. G. Kellogg	Ex-Officio
1st Dist., W. J. Moyle	Union Grove
2d Dist., S. H. Marshall	Madison
3d Dist., Wm. Toole	Baraboo
4th Dist., Arthur Wright	Milwaukee
5th Dist., F. W. Harland	Waukesha
6th Dist., L. A. Carpenter	Fond du Lac
7th Dist., J. J. Menn	Norwalk
8th Dist., W. P. Bussey	Omro
9th Dist., Irving Smith	Green Bay
10th Dist., R. B. Johns	Wausau
11th Dist., C. L. Richardson	Chippewa Falls

COMMITTEE ON FINANCE.

Irving C. Smith	Green Bay
R. J. Coe	Ft. Atkinson
W. J. Moyle	Union Grove

COMMITTEE ON TRIAL ORCHARDS.

T. E. Loope	**Eureka**
S. H. Marshall	**Madison**
R. J. Coe	**Ft. Atkinson**

SUPERINTENDENT OF TRIAL ORCHARDS FOR 1905.

The Secretary.

TRIAL ORCHARDS.

Wausau	Marathon County
Eagle River	Vilas County
Medford	Taylor County
Poplar	Douglas County

LISTS OF FRUITS RECOMMENDED FOR CULTURE IN WISCONSIN.*

APPLES.

Alexander, Avista, Astrachan (Red), Ben Davis, Dominion Winter, Fall Orange, Fameuse (Snow), Golden Russett, Haas, Hibernal, Livland (lowland) Raspberry, Longfield, McIntosh, Malinda, McMahan, Newell, Northwestern Greening, Oldenburg (Duchess), Patten Greening, Perry Russett, Pewaukee, Plumb Cider, Scott, Tolman (sweet), Utter, Wealthy, Westfield (Seek-no-further), Willow Twig, Windsor, Wolf River, Yellow Transparent.

FIVE VARIETIES FOR FARM ORCHARD.

Livland (Lowland), Raspberry, Northwestern Greening, Oldenburg (Duchess), Plumb Cider, Wealthy.

CRABS.

Hyslop, Lyman, Martha, Sweet Russett, Whitney.

PLUMS.

Of the three classes of plums commonly cultivated, viz., European, Japanese, and Native or American, the last named is the most reliable.

NATIVE.

Forest Garden, Hammer, Ocheeda, Quaker, Surprise, Wyant.

EUROPEAN.

Lombard, Moore's Arctic, Reine Claude (Green-gage).

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*The behavior of varieties of fruits is influneced very largely by environment. The conditions of soil, exposure and latitude over such an area as the state of Wisconsin vary greatly and no list can be given that will prove satisfactory in all localities. The following provisional lists were prepared jointly by the Committee on Revision of Fruit Lists and the Secretary. Hardiness of plant and fruit bud has been the leading thought in the selection of varieties.

The "Fruit Lists" which appeared in former volumes have been abandoned. For technical descriptions of varieties leading to the identification of specimens the reader is referred to the "Catalogue of Fruits," issued by the American Pomological Society.

JAPANESE.

Abundance, Burbank, Red June.

CHERRIES.

Early Richmond, Montmorency.

GRAPES.

Brighton, Concord, Delaware, Diamond, Green Mountain, Moore's Early, Worden.

BLACKBERRIES.

Badger, (Ancient) Briton, Eldorado, Snyder.

STRAWBERRIES.

Varieties starred have imperfect flowers and must not be planted alone.

Bederwood, *Crescent, Clyde, Dunlap, Enchance, Gandy, Glen Mary, *Haverland, Lovett, *Sample, Splendid, *Warfield.

TWO VARIETIES OF STRAWBERRIES FOR THE FARM GARDEN.

Dunlap, *Warfield.

RASPBERRIES.

Black: Conrath, Gregg, Kansas.
Red: Cuthbert, Loudon, Marlboro.
Purple: Columbian.

CURRANTS.

Red: Red Dutch, Long Bunch Holland, Victoria.
White: White Grape.
Black. Lee's Prolific, Naples.

GOOSEBERRIES.

Downing.

PEARS.

On account of the prevalence of blight and winter killing, pears are not generally recommended for Wisconsin. Good crops are occasionally produced under favorable conditions, especially in the southeastern part of the state. The following list includes both early and late varieties. List prepared by W. J. Moyle.

Bartlett, Clapp Favorite, Early Bergamont, Flemish Beauty, Idaho. Kieffer, Lawson, Seckel, Sheldon, Vermont Beauty.

TREES AND SHRUBS RECOMMENDED.

EVERGREENS.

For screens and windbreaks—Norway Spruce, White Spruce, White Pine.

For hedges and screens for shearing—Norway Spruce, American Arbor Vitae, Red Cedar.

For lawns—Norway Spruce for backgrounds. For groups—American Arbor Vitae, Siberian Arbor Vitae, Red Cedar, White Spruce, Colorado Blue Spruce.

For small lawns—Arbor Vitae, Savin Juniper, Mugho Pine.

DECIDUOUS TREES.

The more desirable ones are starred, and a further selection of five is indicated by double stars:

**American Elm, Box Elder, Black Cherry, Carolina Poplar, **Green Ash, *Hackberry, Honey Locust, Larch, **Linden, **Norway Maple, *Scarlet Maple, **Silver Maple, *Sugar Maple, Scarlet Oak, *White Oak, White Ash.

DECIDUOUS ORNAMENTAL TREES.

This class includes smaller deciduous trees of more value for ornament than for shade or defense.

Cut-leaved Weeping Birch, Tartarian Maple, Ginnala Maple, Kentucky Coffee Tree, Mountain Ash, Weeping Willow, Russian Mulberry.

LIST OF SHRUBS RECOMMENDED.*

Scientific Name.	*Common Name.*
Berberis vulgaris	Common Barberry
Berberis vulgaris var. atropurpurea	Purple-leaved Barberry
Berberis Thunbergii	Thunberg's Barberry
Corylus maxima var. purpurea	Purple Filbert
Diervilla florida	Weigela (rose)
Diervilla candida	Weigela (white)

***From Bulletin 108, Wisconsin Experiment Station, by F. Cranefield.**

Diervilla hybrida var. Desboisii	Desboi's Weigela
Eleagnus argentea	Silver Berry
Euonymous Europaeus	Strawberry Tree
Hibiscus Syriacus	Althea
Hippophae rhamnoides	Sea Buckthorn
Hydrangea paniculata gr.	Garden Hydrangea
Lonicera Ruprechtiana	Ruprecht's Honeysuckle
Lonicera Tartarica	Tartarian Honeysuckle
Ligustrum Amurense	Amur Privet
Morus alba var.	Tea's Weeping Mulberry
Philadelphus coronarius	Mock Orange
Philadelphus coronarius var. aurea	Golden Mock Orange
Philadelphia inodorus	Mock Orange, large fl.
Pontentilla fruticosa	Shrubby Cinque Foil
Prunus nana	Russian Almond
Rhodotypos kerrioides	Rhodotypos
Rhus Cotinus	Smoke Bush
Ribes aureum	Missouri Flowering Currant
Robinia hispida	Rose Acacia
Rosa rugosa	Japanese Rose
Sambucus nigra var. aurea	Golden Elder
Spiraea Bumalda	Bumalda Spiraea
Spiraea Bumalda var.	Anthony Waterer Spiraea
Spiraea Billardii	Billard's Spiraea
Spiraea Douglassi	Douglas' Spiraea
Spiraea Japonica	Japanese Spiraea
Spiraea salicifolia	Meadow Sweet Spiraea
Spiraea Van Houtte	Van Houten's Spiraea
Syringa Persica	Persian Lilac
Syringa villosa	Chinese Lilac
Syringa vulgaris	Common Lilac
Tamarix Pallasii Desv. (*Tamarix Amurense Hort.*)	Amur Tamarix
Viburnum Opulus vr. sterile	Snowball

ROSES.

Hardy garden—Harrison Yellow, Persian Yellow, Madame Plantier.

Twelve varieties hybrid perpetual—Paul Neyron, Mrs. J. H. Laing, Gen. Jacqueminot, Dinsmore, Marshall P. Wilder, Coquette des Blanches, Earl of Dufferin, Jules de Margottin, Vick's Caprice, Magna Charta, Prince Camille de Rohan, General Washington.

Moss roses—Perpetual White, Salet, Paul Fontine, Henry Martin.

Climbers—Prairie Queen, Russel's Cottage, Seven Sisters, Gem of the Prairies, Crimson Rambler.

COMPARATIVE HEIGHT AT MATURITY OF DIFFERENT SHRUBS.

The height at maturity of the different species must be considered when planting in groups or borders. This will depend so much upon their environment that it is difficult to give the height in feet that any species may be expected to attain. When different kinds are planted under like conditions it may be assumed that relative heights will be maintained. The following may serve as a partial guide in planting:

Tall—10 to 15 Feet.

Barberry (Common)
Barberry (Purple-leaved)
Cornelian Cherry
Golden Elder
Honeysuckle, Fly
Honeysuckle, Slender
Honeysuckle, Tartarian
Honeysuckle, Tartarian white
Lilac, Common
Lilac, Japanese
Lilac, Jossika's
Mock Orange
Privet
Sea Buckthorn
Siberian pea tree (tall)

Medium—6 to 10 Feet.

Crandall Currant
Honeysuckle, Blue
Japanese Rose
Lilac, Chinese
Purple Filbert
Rose Acacia
Russian Almond
Siberian Pea tree (dwarf)
Silver Berry
Strawberry Tree
Spiraea, Billiards
Spiraea, Douglas
Spiraea, Three-lobed
Spiraea, Van Houten's
Weeping Mulberry
Weigelas

Dwarf—2 to 6 Feet.

Althea
Barberry, Thunberg's
Cinque Foil
Honeysuckle, Albert's
Hydrangea
Rhodotypos
Spiraea, Anthony Waterer
Spiraea, Ash-leaved (Sorbaria)
Spiraea, Bumalda
Spiraea, Japanese
Spiraea, Meadow Sweet
Spiraea, Plum-leaved

PROCEEDINGS

OF THE

Wisconsin State Horticultural Society

CONSISTING OF FOUR PARTS.*

PART I.

Summer Meeting

Held at Lake Geneva, June 29, 30, 1905.

MORNING SESSION, June 29.

The meeting was called to order at 9 A. M. in the Opera House by the President, Dr. T. E. Loope.

Mayor Davidson and Mr. Wheeler of Lake Geneva offered greeting to the Society assuring the members of a kind welcome both from the citizens of Lake Geneva and the summer residents.

Responses by President Loope and Mr. Toole.

On motion of Mr. Marshall, Mayor Davidson and Mr. Wheeler were made honorary annual members of the Society.

The first paper on the program was by Mr. Frank Ovenden, on Spring Flowering Bulbs.

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*Part I. Papers and discussions at Summer meeting.

Part II. Papers and discussions at Winter meeting, held at Madison Feb. 7, 8, 9, 10, 1905.

Part III. Reports from local societies, reports of delegates, etc.

Part IV. Business transactions for the year and miscellaneous papers.

SPRING FLOWERING BULBS.

F. OVENDEN, Madison, Wis.

It's an all wind that blows nobody any good.

Whilst many people were complaining of the long, late, cold spring many plants were growing slowly and consequently were developing better. Such was the case with spring flowering bulbs.,These delight in a cool and not too dry an atmosphere, therefore this spring was an ideal one for them. They were slow to appear and a long time before flowering, but when they did flower they fully repaid us for their otherwise tardiness. Moreover they stayed with us longer than usual. I do not remember seeing them better developed nor longer seasoned than this spring. Hence many were the inquiries as to when, where, how and what to plant.

TULIPS.

First, I will take the tulip as it is the best known, most popular, showiest and most satisfactory of all spring flowering bulbs.

The season to plant is from October 10th till the first week in November for this latitude. If planted too early they will be too far advanced and consequently injured by the hard freezing of winter, and if left too late they will not have time to make the root development necessary for the best results in spring.

They can be planted in beds of selected colors to form designs, or with Hyacinths, Narcissus and other spring flowering bulbs and plants, or in the borders of shrubberies as a margin or outside line or in clumps. They will take all the sunshine we get in the spring but will also do well in a partly shaded spot. They delight in a good, rich, light loamy soil though they can be grown very successfully in any soil that will raise good corn. A compost of good loam leaf mold and well rotted manure is the best and will well repay you for the trouble of preparing it. Never use fresh coarse manure, as that is most injurious to all bulbs. The bed should be dug at least one foot deep and well pulverized, rounding it off to prevent the water laying on the bed and rotting the bulbs.

Plant about 4 to 5 inches apart and from 3 to 5 inches deep according to your soil. If heavy 3 inches and if light 5 inches but be sure to plant all the same depth in one bed if you wish them to flower together and evenly. If you wish to plant a bed to a design in colors the best way is to take off 3 or 4 inches of the soil, mark out the design lightly, press your bulbs into place and replace your soil, rounding off the bed so as to be 3 or 4 inches higher in the center. In planting bulbs never use a dibber as a dibber makes a long hole a great deal too small at the bottom for the bulb to go down, and therefore, the bottom of the bulb, the part that needs to have the soil pressed close to it has none at all, or if any it is very loose, and besides you cannot plant two bulbs the same depth with a dibber but with the hand or the two first fingers you can and most likely will if the ground is in good condition go exactly the same depth every time and your bulb is planted firmly to the very bottom of the hole where it will immediately make an effort to root. After planting, there is nothing to be done till frost and just as soon as it begins to freeze the ground in November, cover with about 6 inches of leaves, straw or some similar covering but I would rather not use coarse, fresh manure as that is dangerous often causing the bulbs to rot. I would not cover earlier as in case of a late fall the cover would induce them to push up through the soil. Cover evenly or they will not come up evenly. In the spring uncover as early as possible.

The Single varieties are most satisfactory for bedding as they are more brilliant and showier. The double are also fine and for individual plants or clumps are far more massive, rich and enduring. It is hard to name the best varieties for there are so many and for planting in designs must be chosen with a view to height and season. You cannot do better than consult your nearest florist or a fall catalogue of some leading seedsman. I will mention a few that bloom about the same time and are especially good for bedding.

Red—Belle Alliance, Crimson King, Artus.

Yellow—Chrysolora, Yellow Prince, White Pottebakker (pure white), Queen Victoria (rose white), Cottage Maid (white bordered pink, or often called pink).

Varigated—Kiezerkroon (red and yellow).

The Parrot tulip is quite pretty with its feathered edge. It can be had in red, yellow or varigated.

NARCISSUS.

Next in importance, popularity and showiness are the Narcissi or Daffodils.

They should be planted earlier than the tulip as it takes them longer to develop a root growth. From the 20th of September to the 20th of October is the best season here. Never leave the planting of any of our spring flowering bulbs till spring as by the time you can get on the ground to plant they should be coming up, and if you could plant them early they would make a leaf growth before rooting and you would have very poor flowers if any at all. Daffodils can be planted in clumps in the shrubbery or the herbaceous border as they can be left in for 4 or 5 years. As they do better in a shady situation, developing and holding their flowers longer, they can be planted in the shade of trees on the lawn right in the grass. Anywhere where an early effect is needed is suitable for them, in the spring flower bed amongst other bulbs or in cemetery. They succeed best in a thoroughly well drained, tolerable rich soil, but must have no fresh manure in it as it is certain to destroy the bulb. The tulip soil is alright for them.

Plant and treat the same as tulips; 3 or 4 inches deep, 4 to 5 inches apart and cover as soon as frost comes; but in the spring as soon as through the ground a very weak application of manure water repeated two or three times during their growth will greatly benefit them, making the flower larger and handsomer.

There are several distinct classes of Narcissus. The Polyanthus Narcissus of which the Paper White Narcissus, which you buy at your florists through the winter, is the best example. The Pheasant's Eye or Poet's Narcissus and the Old Common

Yellow Daffodil or Trumpet Narcissus. This last is the one we use for our spring flower beds, etc. There are both single and double of various shades of yellow. It's a matter of choice if you plant double or single. Whilst the double are the showiest and perhaps the largest, I prefer the single as they are the more perfect flower and decidedly the most artistic, and, I think, more certain to flower.

The best double are

Von Sion, large, double, golden yellow, trumpet shaped flowers. Incomparable is also fine and has a light yellow center. Orange Phoenix is a fine creamy white with orange center. These are the best for outdoor culture.

Of the single I know of nothing better than Trumpet Major, a deep golden yellow. Princeps is also fine. It is sulphur white with a yellow trumpet. There are many other varieties which you can find fully described in any good fall catalogue.

The Jonquil, a species of small flowering, sweet scented Narcissus, should also be mentioned here. It is a great favorite in some parts. It has beautiful bright yellow fragrant flowers, both single and double, which are produced in great abundance. Plant and care for the same as for Daffodils.

CROCUS.

The pretty, modest little Crocus I have placed third on my list, as, owing to its short season, it is often despised, but it should occupy first place as it is one, if not the first, of our spring flowering bulbs to welcome the coming of warm weather. The Snowdrop Galanthus, ought to have first place for earliness. As it and the Scilla are so near of a season, habit and treatment as Crocus we will include them under the head of Crocus.

Plant from the end of September to the end of October in any good rich garden soil about 2 or 3 inches deep and 2 or 3 inches apart. Tht Crocus and Scilla combined make a fine border for a bed of other bulbs or a marginal line for any early spring flowering bed or border but the best effect is gotten by massing together in groups or in clumps in the lawn. Lift the sod about 3 inches deep, place 8 or 10 corms about 2 inches apart and replace the sod. They will flower and the leaves die down before the grass needs cutting, and can be left there for three or four years. Their other care is the same as for Tulips.

There are many varieties of Crocus too numerous to mention and all of which are good. There are yellow, blue, purple, white, varigated and striped.

HYACINTH.

The Hyacinth (if successfully raised) is probably the most showy of all spring bulbs, but I find, as a rule, people are not so successful with this bulb as with others, and therefore, with its high price it is not so popular. They should be planted in October till frost comes. Plant in any good, rich, garden soil that is well drained naturally, or otherwise. It should be dug 16 or 18 inches and well worked over; plant from 3 to 4 inches deep and 5 or 6 inches apart, and as with all other bulbs round off the bed. Cover with a mulch of well rotted manure and on top of that leaves, straw or similar covering as with other bulbs. They should be planted to form designs, in beds or in borders and if successfully grown are, indeed, a fine sight in the spring of the year.

They are to be had in red, white, blue, yellow and varigated, in single and double. Amongst the best for bedding are

Blue—Uncle Tom (single), Chas. Dickens (double).
Red—Robert Steiger (single).
Blush White—Voltaire.
Rose—Norma.
Rose Blush—Gigantea; and many others.

Many of you present, and for whom this paper is meant can plant but few bulbs and those mostly in the border or in clumps, therefore, I would advise you to consult your nearest florist or whomever you are buying from as to what to plant. Tell them what ground you have to plant, how much, etc., and he will select the varieties according to color, seasons, height, etc.

The question is often asked, Will they flower next year or another season? If properly cared for they will. If not they will not. First, the Tulip should be taken up each year, but not before its foliage has died down naturally. If you need the room whilst the leaves are still green, take them up carefully and heel them in in some shady place and allow them to remain there till the foliage has dried up, then take up, dry, clean and stow away in a cool, dry place till fall. That is the most important point, a cool, dry place. If treated thus, they will flower just as good next year and for many years. Daffodils, Crocus, Scilla and Snowdrops should be left in the ground for 3 or 4 years without disturbing, and providing you do not destroy their foliage till ripe, they will flower every year, but at the end of the 3rd or 4th year they will be so crowded they will not do well, so in August or September take them up and replant only the large ones, putting the smaller bulbs in the vegetable garden for a year till they gain size. If you need the room before the foliage is ripe, treat the same as Tulips.

DISCUSSION.

Mr. Moyle: I would like to ask if hyacinths are hardy?

Mr. Ovenden: Yes, they are; the double hyacinths all will do very well if mulched late in the fall.

The Secretary: One reason why I asked Mr. Ovenden to present that paper at the summer meeting, instead of the winter meeting, was to emphasize it a little more and bring to your attention that these bulbs should be planted in the fall. People admire my bulbs in the spring and ask where they can get some bulbs, as if they could get them and plant them then and have a show; they must have them planted in the fall, as he tells you.

But I would like to take exceptions to some of the gentleman's statements. He is a professional and brings the thing here in a professional light. Now, we are only poor, stumbling amateurs, and I have stumbled along with tulip culture from year to year and used the same bulbs. I think he tells us that it is a little doubtful whether we can get a crop of flowers from the bulbs after the first year—I wish to stand corrected if that is not right. I had this year a crop of tulip flowers from bulbs that had been planted three years and left undisturbed, they had never been touched. I will not say that that is the best plan to follow, but I do wish to offer you that crumb of comfort, that you can put in tulip bulbs next fall and leave them undisturbed from year to year and be reasonably certain of getting a flower crop, if they are are under conditions similar to those that I planted. I plant them deep enough so that I can plant annual flowers on the ground after the tops have died down in early June, and we have by that means a succession of flowers. Last year I even planted cannas, very deep rooted plants, among the tulips. I do not think that was quite wise. I left the canna bulbs, of course, did not attempt to lift them, and the roots decayed and the tulips pushed bravely up through them, and we had flowers this year. I hope that Mr. Ovenden, who is a greenhouse man, will give us a few hints on another line about bulbs growing in the greenhouse, or forcing bulbs,—tell us how we can have a few bulbous plants in bloom in the house during the winter months.

Mr. Ovenden: Mr. Cranefield's tulips are, probably, an exception if they all flowered. I admit, if you leave the bulbs in the ground from year to year there will be a certain percentage of them that will flower, but I do not remember ever seeing a mass of them bloom on a bed when treated in that way, for instance, that you will get every flower to look nice. If they are planted among shrubbery, or some such place, you can be sure of a few flowers coming up, but I think they deteriorate, they go back, and the flower is smaller every year, unless you may have some exceptional ground, but otherwise I think most people will be repaid by taking up the bulbs and drying them, when growing them in a flower bed. In a border you can leave them the same as narcissus.

The Secretary: Tell us how to force bulbs.

Mr. Ovenden: The rules for winter culture of the tulip, the daffodil and the hyacinth are pretty much the same. The crocus is raised in the greenhouse but very little, the season is so short, it lasts but a short time, and people usually do not care for that. It does not matter so much about the soil in the pots, plant them in any good, rich soil, with the top of the bulb just above the top of the ground, and four or five of them in a five-inch pot, that makes the best show, and put them down in the cellar or some cool place until they are well rooted, and you can plant a number of pots that way and have them stored away and bring them up to the light as you wish them. Stand them in not too bright a light at first, water them, and then after making their top growth, then bring them to the window into the full light. After planting them in the pots, give them one soaking and that should be sufficient until you bring them up to the light. With tulips and daffodils do the same way. The way we do in the greenhouse is, we raise them in "flats" for cut flowers; plant them, put them outside and let them freeze, with the exception of the narcissus, or any of that class. We leave these in the greenhouse and never let them freeze.

A flat is a box a foot long, about 8 inches wide and about 4 inches in depth. They do not need a great depth of soil raised in that way. We place then about 4 inches apart, leave the tops a little above the soil, and we bring them in, thaw them up gradually give them a good watering, and then if we want some pots of flowers in the greenhouse to sell, we can transplant those from the flats into the flower pots; they will bear transplanting after they are in flower; we select those that are nicely in flower and transplant them into the flower pots. Narcissus are only grown in flower pots.

The President: I see the familiar face of our Chicago friend, Mr. Periam, here. I would like to ask if Mr. Periam has anything to say on this subject.

Mr. Periam: I think the question came up, if I heard right, whether the wind flower could be cultivated. I did not hear what the expression was in relation to that, but I see no reason why it should not. On the flat prairies, well-drained prairies near Chicago it occupies a variety of situations, and so I think, Mr. President, that very many of our wild flowers that are now becoming almost extinct, I think that they ought to be looked after more and brought into cultivation.

Coming up along the railroad this morning I saw the most beautiful wild flowers, far more beautiful in color than many of our cultivated flowers, and the forms are exquisite.

Mr. Toole: I think that the subject that we have in hand is of great importance, and I am glad our Secretary has brought it up at this time of the year, rather than in the winter, for the reason he said, that people do not realize that these things must be planted in the fall and then in the springtime they want the blooms. I am aggravated almost every spring with people, because they have seen tulips, hyacinths and different things around, coming and wanting to buy them; they seem to think they can buy them and carry them home for bloom, like geraniums. Then in the wintertime there are many people who like to have these bulbous flowers in bloom, because they find they can have them in bloom when many of the things that love sunshine and must have it, Geraniums we cannot have, but the bulbs we can have even during the dark days of winter, and so it is very necessary that people should know a little ahead and be stirred up to provide for these things a little in advance, and I wish there were more people here to take advantage of what they may learn from those who are in the business. And I am glad that it has taken the turn to wild flowers in one respect. I would like to call attention to the fact that we can have success with some of these prairie wild flowers, like the hepatica which our essayist mentioned in connection with wild flowers, it forces nicely and is a very pleasant reminder of the spring and early summer days to have a clump of these in the winter. We had a sample of these at the greenhouse, my son had taken them and forced them, and certainly they were as pretty in their way as any of the showy varieties.

Mr. Edwards: I would like to ask Mr. Ovenden if he can tell us in brief where he would advise the many home planters to put these bulbous plants, whether on the borders of shrubs, on the side grounds, on the sides of walks or drives, and where he would place them to get the best effect?

Mr. Ovenden: All kinds of spring flowering bulbs may be planted along the borders of shrubbery as an offset to it, or along the drive would be a good place. The best effect will be obtained by planting them in the sun. They will do very well in the shade, but the flowers are not so bright and not so large, but they run up long stems and droop over, but anywhere where you want to get the early effect of color in the spring, along the front of the house and around the veranda or around the walls anywhere, or out in the cemetery lot, any such places. And the daffodil and narcissus can be planted right in the lawn, right into the grass; lift the sod up about 3 or 4 inches and plant the bulbs as you would in clay, press them in. They come up year after year and look fine and soon begin to crowd each other out. Then, of course, they should be divided and they should be planted, possibly, in a place where it is somewhat shady, as they develop their flowers better then and have better color. The crocus also is planted on the lawn a great deal in that same way; that makes a fine border for a bed of spring flowering plants, a bed of pansies with crocus growing around looks very nice; any such place would be all right.

AN AMATEUR'S FLOWER GARDEN.

By MR. H. C. CHRISTENSEN.

It is with almost a feeling of trepidation that a novice addresses a Society on floral topics, so many of whose members are nurserymen, florists and students of horticulture. Men from whose fluent lips roll such euphonious names as Viburnum opulis sterilis, Sambucens aurea; men who can dilate on the superiority of Ampelopsis quinquefolia over Celastrus scandens, in foliage; and can debate the relative merits of Lonicera Branchyphoda aurea and Aristolochia Sipho as to the flower.

But unfortunately all of us are not permitted to have such a close acquaintance with nature's children. I wish to speak particularly to those whose attention is claimed chiefly by the household, the berry patch, or the farm.

To the busy person no class of flowers has so much to recommend it as the hardy plant. Unlike the annuals, these need no careful watching from the time of sowing to the time when they have attained a size sufficient to be recognized as flowers, not weeds. Neither do the hardy flowers need the careful housing that the tender bedding plants require.

Among hardy flowers those that can be used as cut flowers are most desirable. Often times we are denied the privilege of visiting the flowers as much as we would wish, but we all spend more or less time in the house and it is here we can bring the blossoms to brighten and beautify the surroundings. Three times a day we gather around the table and surely flowers can add much of pleasure and profit at these hours.

A few hints as to the growing of these flowers:

First: give them thorough cultivation. No one would think of raising fancy berries or vegetables by digging a hole in the grass and setting a plant there, giving it an occasional mulch or watering. Neither can one expect to raise fine flowers under these same circumstances. Therefore, to aid in giving them proper attention I would suggest that they be planted in rows so that the horse cultivator or wheel-hoe may be run through them, thus keeping the soil loose, moist and free from weeds, with the least effort. While this method of planting may not be as artistic as irregular spacing yet much may be done to overcome the stiffness by introducing the lower growing plants between the taller. While speaking of artistic grouping as to form and size I would mention artistic grouping as to color. Have we not all, at times, had our sight offended by the close proximity of reds, blues, and purples in gardens that would otherwise be beautiful? This is a matter worthy of almost as much attention as the spacing of shrubs and plants.

A *second* necessity for fine flowers it fertilization. Give all plants a liberal dressing of well rotted compost once a year. This will add greatly to the size, quantity and quality of flowers. Perennials are not so apt to be over stimulated as annuals.

I have in mind some peonies that grew under a row of apple trees. These peonies produced fifty to sixty blooms to the plant. The trees were removed and a liberal dressing of manure applied and the next year, by actual count, those peonies produced as high as two hundred flowers to a single plant.

A *third* point. Give protection. Give all plants some kind of a winter blanket, wrapping large shrubs, laying down the smaller and giving herbaceous perennials a heavy mulch of coarse litter. The past winter has shown the value of this treatment. Many of the plants that were killed by the severe cold could have been saved by this means.

Now, as to a few varieties that have been tested and have come through the cold winter safely. First among the shrubs comes the rose and of this class the Hybrid Perpetual would seem to have pre-eminence, as it is hardy, gives a wealth of blooms in June and occasional ones during the summer and fall; the Hybrid Perpetual, also, has a form, fragrance and coloring almost, if not quite equal to the tea rose. Paul Neyron, General Jacq, Coquette des Blanche, Prince Camille de Rohan, and Magna Charta are among the first. Mad Plantier is a fine, white Hybrid China.

Other shrubs that are good for cutting are spireas. Prunifolia as it is very early, Van Houtte with its drooping sprays of white and Anthony Waterer are perhaps the best. Deutzias, Graciles, Lemoninei, Candida have chaste white petals with golden stamens, that recommend them for cemetery uses.

Forsythia is the earliest flowering shrub in the garden, defying, with the snowdrop and crocus, the cold, spring winds. The long, slender branches of the Forsythia, clothed with pale yellow blooms have a dainty Japanese effect. Kerria has globular, yellow blooms and a crimped serrated foliage that makes it a unique shrub. Lilacs, Bush Honeysuckles, Hardy Hydrangeas, Syringa, all these are old favorites that should not be neglected and forgotten.

Among herbaceous perennials, the Peony occupies the place held by the rose among shrubs. Too much can not be said in favor of this hardiest of plants. Georgeous in color, beautiful in form, floriferous, free from insect pest, standing all kinds of abuse, it is no wonder that its popularity is growing. A visit to the grounds of Mr. Galpin of Appleton, who has nearly ninety varieties, would give one an idea of the possibilities of the flower.

Another stand-by is the phlox. The small white or lilac-tinted flower of former years is hardly to be recognized in the improved perennial that we now have. The large panicles of blooms shade from purest white to vivid crimson. The length of its blooming season makes this one of the choicest of perennials. Another plant that is not seen as often as its beauty merits, is the pyrethrum. Its flowers of different colors are as handsome as Marguerites and are valued more because they come at a time when flowers are scarce. Another flower of this type is the Gaillardia; still another is the Shasta Daisy.

Then, there are the iris, lemon lily, grass pink, columbines, diletra, Chinese bell flower, Sweet William, favorites of our grandmothers' gardens, that must all have a place. If one is looking for some of the less hardy kinds of flowers, the Canterbury Bell, Foxglove, Calliopsis, Hibiscus, might be tried.

But let me give you a word of warning from one who has had sad experience. Do not attempt too many varieties. Better a small quantity of high quality than a large quantity of indifferent quality.

DISCUSSION.

Mr. Toole: I am glad Mr. Christensen feels safe in giving us such a wide range of shrubs to choose from, and having done so, I would like to add one which was a great favorite with Professor Goff, and that is our hardy tamarisk, *Tamarisk Amurense.* It is in bloom with me now and will be in bloom most of the summer, the feathery light green sprays and feathery blooms also are certainly very attractive at the present time. It will increase in beauty for a little while; for a while it will be a little ragged, then it will fall away and be succeeded by two or three growths during the summer, and I wonder that it is not placed more in the market by nurserymen who offer hardy shrubs; it is hardier than many of the things that we do not question the hardiness of. It sometimes kills back; if it did not it would get straggly, rough and coarse in appearance, if we do not learn that the first thing to do is to cut it back and in that way keep its shape and keep up its natural beauty all the time.

In regard to hardiness, it is a relative term, and many things have been spoken of as hardy, and yet after all you cannot leave them year after year, like perennials. Our perennials are all of them positively hardy if you do not let the grass run them out, or if you do not divide them up. Many of these things, if we do not divide them up, they will become weeds, the perennial phlox you must divide up once in a while.

We have a phlox up here which is seldom grown. I am much pleased to see what we have here, such as the deutzias and the dephinium, those bright reds that you see over there, and also the pyrethrum. I have a growth of those; they have been in the grass and in the shade of trees for nearly fifteen years. Now, it is well to tell of these things that will stand in the grass, that they are apt to get too much of it and they will not fight the grass until they are well established, but after they are once established, they will hold their own with the grass.

Mr. Ovenden: I would like to ask a question as to the Canterbury Bell and the Fox Glove—how would you protect them through the winter? I have had some this winter, nice strong plants, and I thought I would get them through, but many of them died out on me.

Mr. Christensen: I think in raising this class of plants we often make a mistake by starting out to plant too early. By having a plant of a medium size you are much more apt to winter them than where they are large, and then as a covering have leaves, or something like that, and placing over that a roof made of grass so as to shut off all water, and I think if this care is taken of it, you will have no trouble. We winter our Canterbury Bells in that way, and they are generally as difficult a crop as any that we have.

Mr. Edwards: Mr. Christensen, would you recommend to the people in this latitude the raising of many of the deutzias?

Mr. Christensen: The deutzias that we have had some ten or fifteen years, this winter came through without freezing; that certainly speaks for them. If they could get through the past winter they could get through almost anything. One that is very fine is a double white with a touch of pink on the outer petal.

Mr. Edwards: We find that as hardy as anything we have.

The Secretary: I found the Deutzia gracilis just as dead as any other this spring in Madison; a little deader, if I could coin the word, it had even root-killed.

Mr. Moyle: I agree with the Secretary. The Deutzias, where they are covered with snow are all right, but there is not one that will stand through the winter without protection. If they are located where the snow will blow in on them they will come out nicely, but if left out and exposed to the weather they are sure to die.

President Loope: That is my experience.

Mr. Toole: If we apply the test of hardiness to some things which are applied to others, for instance, our perpetual roses, if we can protect them in any way and carry them through we are satisfied with their hardiness, that they are hardy enough for us, and so it is worth our while growing perpetuals, by laying them down and protecting them, and I think we are well repaid. About these other shrubs, if we do not get the snow, cannot we make up for it by boxing up some leaves around them, or something that would protect them. I did not notice the weigelia are included among those that are worth while carrying through. I think it is worth while to give as much care to the weigelia as some of the others; but particularly I wish to ask if any of these things which we are now questioning the hardiness of, if we cannot carry them through if we are willing to give as much care to protect them as we do hybrid perpetual roses.

Mr. Moyle: There are degrees of hardiness with the weigelias; the Rosea weigelia and Hortensis rubra are hardy and stand the winter readily, while the Amabalis weigelia and Candida weigelia froze back. The Rosea and Hortensis rubra lived and bloomed nicely this past summer. This Hortensis rubra particulary interested me, because it is a new variety, and I questioned whether it was hardy enough to stand a hard winter in Wisconsin, but it come through all right while the candida froze right down to the ground, so there are degrees of hardiness.

Mr. Christensen: In my paper I emphasized the fact of winter protection; I think that even the hardiest of our plants, the ones that were spoken of, the larkspur and the pyrethrum, I think they are benefitted by a covering. We cannot expect to raise the finer flowers without this covering, and we must give it with such as the deutzia and the hardy perpetuals; and the weigelia,—I do not know how I omitted that one, because I think that is one of the finest shrubs, and I am surprised that a shrub that we have had as long as that is not more widely disseminated, it surely should be included in the list.

Mr. Periam: I think, as I always do, that we must take this question of hardiness with a good many grains of allowance. Now, my experience in Illinois is, and it ought to be the same here in the open country, that plants are blown to death more than they are killed by the absolute frost, that is to say, the winds blow the vitality out of the plant. My experience, or rather my observation is, that more plants are killed by smothering than by improper protection of plants. I will give you a case in point. My son-in-law bought a farm in Michigan, a fruit farm up near Grand Rapids which is very extensive. On that farm is a beautiful osage orange hedge and where that is, about in the latitude of Sheboygan, on the other side of the lake, they have great snows there in the winter. This winter that osage orange hedge, which has always been well taken care of and was magnificent last year, was killed half-way up by smothering of snow; no doubt of it at all, because there was the line that I could see well defined, and on top, above that, it was partially killed, that was by being blown by the drying wind, but that hedge was undoubtedly killed in the bottom of the great weight of snow on the plants, and very often we find that in plants that are covered, that they are smothered rather than absolutely killed from absolute frost.

The President: I wish to say that I believe with Mr. Periam that circumstances alter cases and surroundings, and this winter my weigelia came through all right, the deutzia that we got killed down to the snow, and the rest of it is as nice as can be. I noticed with some of my neighbors the weigelia were killed, the same kind, I have got the rosea, so that the surroundings and location and things like that sometimes make a difference.

Adjourned until 2 P. M.

AFTERNOON SESSION.

The meeting was called to order by the President at 2 P. M.

The Secretary announced that copies of the 1904 report were on hand for distribution.

The President: The Secretary will read Mr. Hanchett's paper on "Eldorado Blackberries."

ELDORADO BLACKBERRIES ON BADGER STATE FRUIT FARM.

W. H. Hanchett, Sparta, Wis.

Our attention was first called to the Eldorado blackberry some six years ago by a short article in the Wisconsin Agriculturist written by our genial friend and brother horticultural crank, Walter J. Moyle.

Walter always did have an eye for the sweet and beautiful, so when he declared uncompromisingly in favor of the behavior of the Eldorado on our list for trial, purchased 100 plants, set of the Eldorado at the station that settleed it and we put it on our list for trial, purchased 100 plants, set them on the most unfavorable spot on the farm, gave them the most shiftless cultivation of anything on the farm and were agreeably surprised to be rewarded by large luscious berries that in flavor were ahead of any other variety we had ever tried. Thinking them worthy of better treatment after having tested them two fruiting years we planted two and one half acres on virgin soil that had just been cleared of heavy timber.

We gave them thorough cultivation and they made a fine growth. The next season we harvested 125 cases of the finest blackberries we ever saw from this plantation of yearlings. In the season of 1903 after having nearly one half the crop destroyed by a frost the 1st week in June, we harvested from the two and one half acres 1,125 cases of fine berries which held up in size and flavor to the last berry. This was the first crop from full grown canes. They again promise a magnificent crop this season and we give them full faith as being the most satisfactory blackberry we have tried and we have tried Snyder, Stones Hardy, Early Harvest, Taylor's Prolific, Wanchusett Thornless and Briton. They surpass Briton, which has been our leading market berry for years, in size, flavor, appearance, and healthfulness of foliage and equal it in productiveness and shipping quality. In season it is about ten days earlier than Briton, ripens its crop rapidly and is done about the time Briton is at its height of ripening. In fact it is gone before the trade begins to tire of blackberries.

It is rather more difficult to cover for winter than Briton as the canes are heavy and brittle, but in the language of our friend Kellogg, "If we could have but one variety it would be Eldorado."

DISCUSSION.

Mr. Kellogg: The paper refers to Mr. Moyle; can we call on him?

Mr. Moyle: In regard to the Eldorado blackberry, I may say that I first became acquainted with it when I was at the Station at Madison, I think I wrote an article in some paper in regard to it. Mr. Hanchett seems to have had a good deal of faith in my statements, anyway, he ordered it and tried it, it proved to be a fine blackberry. We have fruited it since, I have myself, and I have seen it fruiting on other people's land, on other soil, and while it is not exactly an iron-clad berry, it is very nearly as hardy as the Ancient Briton or Snyder, and altogether I consider it a very fine blackberry.

Mr. Kellogg: Where did it originate?

Mr. Moyle: It originated in Ohio. It was found growing wild in the field or in the woods in Ohio. I wrote to the man who introduced it and found out all about it. He was anxious at that time to have it introduced, but I was not in a position to take hold of it at that time. Since then it has been generally disseminated throughout the whole country through the experiment stations and by the nurserymen.

The President: Mr. Moyle, you say it is very nearly as hardy as the Ancient Briton or Snyder. In my opinion there is a great deal of difference between those two, and you do not make it very clear. The Ancient Briton will not stand winter, the Snyder will sometimes.

Mr. Moyle: Well now, my experience with those two blackberries is just like this—the Ancient Briton is hardier in the root than the Snyder. Set the Ancient Briton and Snyder out, while the Ancient Briton is more tender in the cane, yet the Snyder, when it kills back, kills back root and branch. Ordinarily the Snyder is hardier in the cane than the Ancient Briton, will stand up better, but the nature of the Ancient Briton is to grow supple straggling canes, on that account it is often laid down on the ground where it is not susceptible to the freezing that the Snyder is that stands more upright. All these new blackberries that were introduced that are claimed to be perfectly hardy, iron-clad, are not found to be so. The Marshfield was introduced five years ago, it is tender as the Erie or Minnewaska.

The President: The Briton will keep perfectly if laid down, with something on top to keep it there without covering. Will this Eldorado do that?

Mr. Moyle: Well no, the Eldorado is a little stiffer in growth. It is more branching than the Snyder, it is more inclined to grow low and flat.

The President: But you have got to cover it with earth?

Mr.Moyle: Yes, I think so. I would not recommend it to be perfectly iron-clad and stand up throughout an ordinary winter.

Mr. Menn: I would like to hear from Mr. Edwards on the Eldorado.

Mr. Edwards: We have not fruited the Eldorado to any extent, so we would not have any information.

Mr. Moyle: I would say further that many varieties have been sent out under that name, so you would better look out on that account. I have ordered the same variety from reliable firms and obtained different kinds. There was a great demand for them and the nurserymen sent out anything they had to fill the orders, so if you get a blackberry that has a poor berry the first time, you must not make up your mind that it is the Eldorado, the true Eldorado is a fine blackberry.

Mr. Wilkins: Will somebody tell us something in regard to Stones Hardy?

Mr. Edwards: I do not know that there is anything new to say on the Stone's Hardy. I do not believe that there is any blackberry that the people in the northwest can depend on living through the winter without a little protection, although our bushes went through last winter without covering, that is no criterion. The only safe way for a person to do, if they are raising blackberries for the market, is to lay them down if they want to be sure of a crop, and then, to make it still easier, you have got to have a moist season.

The President:. What about the Stone's Hardy in fruit?

Mr. Edwards: It has fruited excellently there before this dry season that we had; you know we had a period of probably ten years, very dry years, the crop would start nicely and then would drop from the bushes; then we had winters five years ago that killed top and root of the blackberries, it cleaned us out, and since then we have had no Stone's Hardy. But when Mr. Stone lived at Fort Atkinson he had an enormous crop of Stone's Hardy; he did not cover them, but I could not for a minute think that it is safe for this Society or any individual to recommend the not covering of any kind of blackberries.

Mr. Kellogg: Do you know where Mr. Stone got the original plants?

Mr. Edwards: I think he got them at Milford. He named it Stone's Hardy and sent it out, and he had the fruit men of the state meet there, and I believe one year many of them went to fruiting it and of course that gave them a great boom and that year the fall was wet and it was largely disseminated at that time and has many friends today.

The President: I think we should be a little careful about recommending certain things. I could not recommend Stone's Hardy, it never did anything with me, the berries are not large and are not nice and there is nothing in it to equal the Ancient Briton. We know that it is good, and of course the Snyder is an early sour berry, it grows and thrives and bears berries, but they are sour; so if there is any new and better berry than we have got, we want to know of it. I have not raised the Eldorado, so cannot say whether it is better or not, but I never could succeed with Stone's Hardy.

Mr. Menn: Mr. Edwards, is it not a fact that not one-half the blackberries are grown in this state that there were ten years ago?

Mr. Edwards: Why no, that winter five years ago killed them off.

Mr. Wilkins: Isn't it a waste of time to try to raise blackberries in this country anyway.

Mr. Moyle: No, I do not think that is true.

Mr. Menn: I am talking about them in a commercial way. I have a row of Stone's Hardy that I never covered last winter, never did anything, and while that came through with me, it might not do it anywhere else. I use blackberries just to play with, I do not expect to raise them commercially.

A Member: We had a crop of Stone's Hardy and they commenced to ripen nicely, but fell off and we did not have much of a crop.

Mr. Wilkins: There is a great showing this year; last year there were a great many berries that did not mature, I do not expect to get any, but I have grown them. But if there is any blackberry that is a success like the Loudon and Millers Red in the raspberry line, I would like to know.

Mr. Edwards: I never was more surprised in my life than when I went up to Ripon about ten years ago, I never saw such a crop of blackberries as I saw there of Ancient Briton on Mr. Hamilton's ground and on Mr. Kellogg's ground. But now they are practically all gone, and they say they will not do as well as they used to. Now, these different kinds of soils enter into that question largely, I think.

I want to say further that I do believe that the blackberries, these kind that have been named, are proving as good a success, as far as the bushes are concerned, uncovered, as many kinds of the red raspberries, because the anthracnose is simply killing the bushes, a large part of them.

The President: The fact is, as Mr. Edwards states, that at Ripon the large growers have not got any blackberries. There are small patches now that are looking fairly well this year, but the large growers have not got any, they have gone out of the business. The idea that they give is that they got some root gall and one thing and another, and the land propagated that and they cannot raise blackberries on that land. They do not say but they might raise blackberries on a new plat of land somewhere, but they have not got that. They have raised it all over the farm, different places, and they have not got any new places, but there was a series of years when blackberries were practically exterminated in that whole section, and it has not got back, it never will. You have got to commence somewhere else to get the enthusiasm to go on and try to raise blackberries, and the same with raspberries, right in Ripon and all about that section of country, there is not a quart of raspberries raised there where there were bushels and bushels a few years ago, and for the same reason,—anthracnose and winter killing and the like of that. They have gone out of business, that is all there is of it.

Mr. Moyle: Would you think the blackberry would grow on a new ground?

The President: Without doubt they might do a great deal better, and probably would in new ground.

Mr. Kellogg: According to Mr. Hanchett's paper, on new ground, new plants, the new variety is a wonderful success. Now can you take it and go throughout the state? Unless you get into the same circumstances of soil and culture you cannot do the same thing. As the President says, the Ripon ground has been trampled all over and they have gone out of the business; they have not got new ground to put it on. I used to consider it the prince of the smaller fruit at one time; it is always too late for the frost, although Mr. Hanchett says June frost cut him off last year, but still it is almost always too late to catch a frost, and the crop is sure unless it is cut off by the drouth. I believe a blackberry plantation under proper treatment is more successful than any other small fruit at the present time.

Mr. Edwards: I would like to have Mr. Christensen's paper brought up again. I want to ask if he would recommend a man to plant budded roses, or whole root roses, and if so, why, when, where and how. I mean this, we are confronted with this proposition, we have to start from our own roses, and if we plant them out on their own roots, they are very slow to start, and they give very poor growth without fertilizing very heavily. Again, if you take those weak growing roses and graft on another which is a strong grower, they will give you abundant bloom and will give you more effect. What shall we do; shall we give them budded roses on their order and instruct them to plant them deep, or shall we confine ourselves to all root roses entirely?

Mr. Christensen: When I wrote my paper I headed it, "An Amateur's Flower Garden." The word amateur has got to have the meaning nowadays of an enthusiast who demands the impossible. Sometimes he succeeds. But in regard to this question here, I think that if nurserymen would instruct their patrons with regard to this matter I should certainly give them the budded roses. I think that nurserymen neglect to instruct their patrons and that is where a great deal of the trouble lies. It is not because people are stupid, but because they have not the knowledge of the right method, and if they had the knowledge they would give them the right treatment.

Mr. Toole: I would like to ask, why plant them deep when you have them on this five-year stock?

Mr. Kellogg. So as not to break off at the bud.

Mr. Christensen: To keep them from sprouting out.

Mr. Toole: I am not sure about keeping them from sprouting.

Mr. Kellogg: I always recommend my customers to plant a hybrid rose, or any other rose that is budded, into the ground, so that you can put it down and get it down so that the connection with the bud will be below the surface of the ground, and then when they want to protect it in the fall, take out a little dirt on one side, bend it over and do not break off at the bud. There is the great trouble; you get the bud broken off, and you will have a sprout of the root come out and—"What is the matter with my roses?" They break off the top and they have nothing but the wild stock left.

The President: Now, Mr. Edwards, I would like to have you answer me a question. I like roses, but I cannot grow them in my soil, they kill out. I have a thoroughly enriched sandy soil and a little clay ground, and my roses kill; I cover them, but they get killed, do not blossom, do not come up, do not grow. Isn't it better for me to buy two or three year old strong roots each year, set them out early in March and let them take their chances and to get what roses I can from that year and then buy some more next year.

Mr. Edwards: It would be better for the nurserymen, but it would not be as well for you.

The President: Wouldn't I get more roses?

Mr. Edwards: No, you ought not to. To go back to the soil, you say you furnish them sand and prairie soil?

The President: Yes, thoroughly enriched sandy soil.

Mr. Edwards: To get the best success out of roses they have got to have a composition clay soil and they have got to have plenty of sun. I do not think anybody can raise roses without they have got quite a composition of clay in their soil as a foundation, and perhaps as a mixture.

Now, the vital question to the rose growers of this country is, whether they shall use own roots, or whether they shall use budded roots and how deeply to place them. Now, if I were you I would take it for granted that once in a while I would have to transplant or buy another rose in case one died, the same as if you lost an appletree or anything else that you might have in your possession, but on general principles you ought to get far better blossoms off your roses the second, third or fourth year than you will the first year, get finer blossoms. Why? Because they have got established and they have got a chance to feed that blossom, and I have come to the conclusion that we have positively got to use some budded roses if you use such kinds as the weakly growing sorts. Mr. Christensen spoke about the Magna Charta as being not a prolific bloomer; I know it is a small bloomer, just the same as Madam Plantier. Now, Doctor, have I answered your question?

The President: Yes, fairly well.

Mr. Edwards: I never would plant roses every year. I have a rose bed that stays by me a great deal better than that.

The President: I omitted to say that when I set out these roses I dug out of the ground the sandy soil and I did fill in with clay, but it did not seem to do me any good. Then I covered it with sand and put them in that.

Mr. Kellogg: When horticulturists get together they have got to have more sense than any other set of people, they have got to take everything with an allowance, and believe what everybody says and disbelieve what everybody says. Mr. Edwards says you must have clay. Now I grew 2,000 rose bushes at Janesville on prairie soil, a portion of it was not fit for white beans, I had to enrich it and brought it up to good tilth and I made a success of it, and I have photographs here to show it. Now the mice have killed off everything, except a few, but I wish to say that you can grow roses on good garden soil, I do not care if it is all sand. I think clay is the best, but if you have not got clay, why, if you go and cart in some more, cart in more than the Doctor did, and mix it up well, don't put it in the bottom of the trench as he did, mix it up with other soil, you can grow roses.

Mr. Periam: I want to emphasize what Mr. Edwards has said in relation to soil. Now, the strongest clay soil you can get is the best soil for roses. The great rose growers in Chicago raise their roses on absolute clay soil; some of the most successful have the heaviest blue clay. But you must not on a clay soil, give your roses too wet feet, the drainage must be perfect.

The President: In this day and age we have bugs to contend with. When Mr. Periam was a boy they did not have any microbes or germs or any of those bacilli nor many of these other insects, and everything was lovely then. But today, if you are going to have a surgical operation you must not let the surgeon stand and operate with his mouth open, because every time he breathes he breathes out into the operation three millions of microbes, so he has to muffle his mouth when he operates. Now we will introduce to you Professor Sandsten of the University of Wisconsin, who will talk to you upon bugs.

NOTES ON INJURIOUS INSECTS AND FUNGUS DISEASES.

Prof. E. P. SANDSTEN.

If the question were asked personally to each one present in this Convention, "What is the greatest drawback to successful horticulture today?" I think the majority would reply, "Insects and fungus diseases." Every tyro in horticulture has had his or her experience with "bugs and diseases." Our forefathers tell us that they were able to grow fruit and flowers abundantly without labor and care. "Bugs and diseases" were unknown plagues to them. Why then this sudden and widespread appearance of these, our deadly enemies. The reason for their appearance is a natural one and follows the law of equilibrium in nature. Man is the greatest disturbing factor in nature. He has transformed the whole face of nature to suit his own need. Without his interference the pristine conditions and balance would exist today. In every new country there is a mutual equilibrium between different kinds of insects. Each holds the other in check—likewise there is a balance between diseases. But with the wholesale clearing and destruction of the original forests, the removal of the natural food supply and home of these pests and with the increase of planting of fruit trees and flowers the insects were driven from their home to find new pasture. Many of these pests were obliged to change their habit and feed on plants which they had not fed on before. Our fruit plantations offered them new pastures and these they have not been slow to occupy. From this cause alone a great number of our most pernicious insect pests and fungus diseases have come. Then too, through the rapid and easy intercourse and exchange of plants from different parts of the country and from foreign lands, a large number of foreign species of insects and fungi have been introduced. Chief among those introduced from foreign lands are the San Jose scale, gipsy moth, cabbage worms, etc. These pernicious insects have caused wholesale damage to fruit growing and have vied with our native species in destructiveness.

The increase and damage caused by insects and fungus diseases follows, as has been before stated, the natural law of equilibrium. We notice that some seasons some classes of insects are more numerous than others. For example, the last two years we have had an epidemic of cottony scale, infesting the soft maple and box elder in this state. Up to last season very little was heard of this insect, but last year the complaints against this intruder were very numerous and this year a large percentage of our soft maples and box elders are infested, but I predict that the insect will soon fall back to its natural place. The same is true in regard to other insects. The American tent-caterpillar, which once every few years denudes our grove and park trees, is not very injurious for more than one or two seasons. Then they are again reduced to their natural number by a number of parasites that prey upon them. The same is true of the chinch bug, which has made wheat growing in several states a risky business. When the chinch bug becomes very numerous and the climatic conditions are favorable they are attacked by a plant parasite, and this disease is communicated from bug to bug until the whole tribe is almost annihilated. Then the remaining few insects are given a chance to breed up until they again reach their maximum when they are again attacked by the fungus. So nature aims at equilibrium. No one class of insects or fungi or any wild animal for that matter, can prevail for any length of time over the rest of plant or animal life.

It may be of some interest to this Convention to give a brief life history of the cottony scale, since it is attracting a great deal of attention by all interested in shade trees. The pest belongs to a group of insects known as scale insects. If we take the fluffy white body as we find it on the twig and look at it carefully under a hand lens, we notice that the whole white mass is composed almost entirely of minute white eggs. Each cottony mass contains from 1,000 to 2,000 eggs. These eggs hatch about the first week in July. The young insects or lice crawl out on a leaf and attach themselves along the mid-rib where they insert their tiny beaks and begin to pump up juice from the leaf. The lice are first of an orange-yellow color but gradually change to pale yellow. Soon after the insects begin to secrete their scales or covering. In about three weeks they moult or change skin. The covering or scale also begins to increase in thickness. The difference between the male and the female insects now begins to be apparent. The males are more slender and smaller in size and soon cease to grow. At this the insect enters into the larval stage. The larval stage is of short duration and soon the mature male insect appears by gradually raising the posterior end of the scale thus permitting the insect to back out from under it. The male insect is provided with wings and flies about for a short while seeking the female after which they die. Meanwhile the female insect has undergone similar changes and have increased greatly in size. The insects remain on the leaves until autumn when they migrate to the twigs and become coated with a covering or scale. The eggs increase rapidly in the spring and distend the body of the insect until they are ejected together with the white, waxy fibers. The egg mass soon comes to occupy the whole scale, the body of the female being pushed to one corner, and is so small as to be easily overlooked. The female dies at this time.

Due to the fact that the shade trees are generally large the insect is difficult to combat. Kerosene emulsion, made in the usual way, is very effective if it can be applied thoroughly.

Winter treatment is preferable to summer. The trees can then be pruned back and sprayed more thoroughly.

But we should not look upon insects and fungus diseases as an unmixed evil. I am almost inclined to assert that they are a "blessing in disguise." If it were not for the difficulties occasioned by the insects and fungi, fruit growing would not have reached the present state of development, nor would the growing and marketing of fruit be a profitable occupation today. These enemies of horticulture have discouraged and in many cases eliminated a host of careless cultivators, who are not willing to engage and conquer the enemy, and I further venture to say that the presence of these enemies have done much to educate the horticulturist along his chosen lines since they have forced him to become an observer and experimentor along many lines that have been a decided gain to horticultural development. The time is past when the planter of fruit trees or flowers can expect to get returns without work. Nature is not willing to yield her bounties to the lazy or indifferent cultivator.

To successfully combat the insects, one should be familiar with a few fundamental facts. It is not necessary to be an entomologist in that sense of the word, but the horticulturist should have a knowledge of the nature and habits of the enemy he is combating. We divide insects into two classes, based upon the way they appropriate their food, namely, biting and sucking insects. To the former class belong all the insects that have their mouth parts adapted for biting and chewing their food, to the latter class those whose mouth parts are provided for sucking up their food. To successfully combat the first class, we should use insecticides which the insect will take up with its food and thus poison it. Arsenic in various forms is the most universal remedy against this class of insects. For sucking insects which do not chew the food arsenious poisons are practically useless. These must be combated by some contact insecticide that will penetrate the covering of the insect or else clog up the breathing pores of the insect and cause death by suffocation. With these two facts in mind the horticulturist can easily determine for himself which class of insects he has to fight and what kind of remedy he has to apply in order to exterminate them. It is very easy to tell to which class a given insect belongs by carefully watching its ways of feeding. As a rule plant lice of various kinds and scale insects belong to the class of sucking insects. Caterpillars, beetles and various kinds of cut worms and like insects are biting or chewing insects.

In order that insecticides may be effective they should always be applied before the enemy has gained a foothold. As a rule horticulturists do not watch their plants carefully enough. No insecticide will remedy damage already done though it may kill the insect. Spraying should be looked upon as an insurance and should invariably be done before the appearance of the enemy. The enemy is always there in few numbers, but due to the fact that they increase it requires eternal vigilance and alertness to successfully combat insects and fungus diseases, and the successful horticulturist must be on the constant lookout for their appearance.

DISCUSSION.

Professor Sandsten: Now I have brought a few other things that you may be interested in and have had some trouble with. You are all familiar with the black knot on the plum. There is a mature specimen that is found quite often on a wild cherry and plum. There is one that has just been infested, it has not changed color, but from one part of the tree to another the disease spreads very rapidly and the orchard would soon be infested if you did not cut that back. Now spraying against this disease when it has once entered a tree is practically useless, though spraying will prevent the dissemination of the spores, so if you have these specimens in your orchard or on your plantation, cut them out and then spray with Bordeaux mixture.

Mr. Kellogg: Cut them out and burn them?

Professor Sandsten: Yes. Of late we have received a number of inquiries from nurserymen and others about the scale. We have a scale that is well known and widely disseminated in the state, namely, the oyster shell bark louse. It is a scale that a person would not ordinarily look for, and many people think it is the San Jose scale. It is found all over and at this time of the year the young ones hatch and crawl out towards the new growth, and you will find small remnants of the small scale at the beginning of a new growth, but that scale is not very injurious. This was hatched probably about two weeks ago, and there are very few orchards in the state that are not infested with that scale. Most of the nurserymen know what they are, and it is not a very bad one. A spray with kerosene emulsion or whale oil soap will kill it, but an ordinary spray with Bordeaux or Paris green has no effect upon it. They are present in every orchard; I have found too, that the experimental orchard at the University has a great many of them, but they have not caused much damage up to the present time, although no doubt they are doing some damage.

Then you are all familiar, you plum growers, with the Monilia. Here is a twig that I took from our trees, we had one or two with the disease, that is the way the blossoms grow. Now the fruit grower would call that blight, that is not the blight at all, it is the Monilia, the same disease that attacks the plums when they are nearly ripe. In this case the spores enter the blossom and go into the twigs and they kill the whole row of plum trees.

Professor Sandsten: That disease is a very bad one, it is the worst one that a plum grower has to fight against. Now, spraying with Bordeaux should keep this in check, providing we kept the Bordeaux on it all the time, but it washes off and the disease comes in and before we know it, in 24 hours it has damaged it beyond redemption, so suddenly does it come, like a thief in the night.

Mr. Moyle: Does it affect the fruit of the plum later on, and in what way?

Professor Sandsten: It is the brown rot, the same disease as the brown rot, the Monilia.

Now, here is the plum aphis, that is very prevalent this year. Kerosene emulsion will kill that off. It has not done must damage, but they do some damage, especially to nursery trees more than to an orchard.

Mr. Kellogg: Have you the plum pocket here?

Mr. Sandsten: I had some specimens here, but somebody took them out. The plum pocket is a disease something similar to the Monilia. It attacks the small plums and blows them up like a balloon, or pockets, and that disease can be controlled by timely spraying with the Bordeaux. We had two trees in our orchard that were attacked with it, but we sprayed the trees and the neighboring trees and we find it entirely gone. I do not suppose we had 25 plums that were attacked, but we had a number of samples sent in that were, and the disease is very prevalent in the state.

I should not hesitate to spray right in blossom time when the trees are in full bloom if my trees were attacked with the Monilia.

Mr. Marshall: I want to emphasize that statement. I think the only time to spray the second time is right when your trees are in full bloom; if we wait another day it may be too late.

The President: What about the neighbor's bees?

Professor Sandsten: The neighbor's bees will not be hurt by the Bordeaux, and there is no law in this state in that regard. An effort was made in New York State to prevent a fruit grower from spraying while the trees were in blossom, but I do not think the law could be upheld, because a person should have the privilege of spraying his own fruit trees, but in the case of Bordeaux it would not make any difference. I would not hesitate spraying apples and plums or any of them, even if we killed one-fifth, sometimes it would be a good thing, because you would save a lot of thinning.

Mr. Kellogg: Then you would leave out the arsenic?

Professor Sandsten: Yes, there is no use in putting in the arsenic at that time; then there would be no danger in the Bordeaux.

I have brought some elm leaves that are infested with the elm aphis; the only way to get rid of that is to spray with kerosene emulsion and whale oil soap.

Mr. Toole: In regard to the aphis, the trouble we have I think is that each year by the time we get around to spray, the leaves are all curled up, and the aphis are curled up inside and you cannot get at them. They hatch the eggs early, about the time the buds are swelling.

Professor Sandsten: The eggs will hatch just about the time the leaves come out in the spring. The aphis, the insect itself during the summer season does not lay eggs but give birth to young, the egg stage is passed. The eggs are produced in the fall and winter, in the egg stage.

Mr. Toole: Then it would be well to catch them in the egg stage, or when just coming out.

Professor Sandsten: Yes, the time to spray for aphis is just before the leaves come out. After the leaves are curled up you cannot reach them and you are too late with your spraying; spraying has to be done in time, or else it will do no good.

Mr. Toole: Do you make a combination remedy of Paris green and Bordeaux mixture to attack worms and fungous diseases?

Professor Sandsten: We do.

Mr. Toole: Can you put in at the same time some kerosene emulsion and kill everything?

Professor Sandsten: I would not venture to say, although it has been tried and it has proven a success. Paris green and kerosene emulsion do mix and form a good combination.

Mr. Toole: I notice the use of ivory soap has been recommended, perhaps some other soap would do. Could we get along with soap, without the whale oil and kerosene?

Profesor Sandsten: Why yes, a good many recommend it. It has proven quite a success to use it at the rate of one half to three-quarters of a pound to the gallon of water; that forms a fairly strong suds that is very effective against many of the plant lice, but only those that have no covering. Green lice would be killed with it, but scale like the oyster shell bark louse and the San Jose scale would not be affected.

Mr. Toole: It may be applied to the aphis?

Professor Sandsten: Yes, the aphis would be affected, it has no covering.

Mr. Kellogg: Three-quarters of a pound, that is so strong it killed my rose bushes.

Professor Sandsten: What kind of soap do you use?

Mr. Kellogg: Whale oil soap.

Professor Sandsten: That is too strong, I said Ivory soap. Most of the soaps have a certain amount of alkali in them that may prove injurious. The Ivory soap is practically pure soap.

Mr. Kellogg: Tar soap is effective also.

Professor Sandsten: Yes, but you ought to use a smaller amount.

Mr. Kellogg: We killed the rose bugs beautifully,—and the rose bushes.

Professor Sandsten: Well, that is good work. In that case I should recommend using kerosene emulsion.

Mr. Kellogg: Now supposing a neighbor of mine has a dozen roses and two or three plum trees and the aphis comes on, how can they make a kerosene emulsion? You, who make it by the barrel know how to make it, but how can you tell these amateurs to make a pailful?

Professor Sandsten: Take two gallons of water and take a pound of soap, boil the water; dissolve the soap in the boiling water and then add a quart of kerosene and strain it and you have the emulsion. Then add eight gallons of water to make the spray, and you can use part of that one day and part the next, kerosene emulsion will keep. That is safe, you need not be afraid of injury to your foliage; use a pound of soap, two gallons of water and a quart of kerosene; any good, hard soap will do.

Mr. Edwards: That would be one to 16 of kerosene oil?

Professor Sandsten: Yes, kerosene is a little more effective in emulsion.

Mr. Moyle: Hard water or soft water?

Professor Sandsten: Yes, either. Soft water is recommended, if you can get rain water it would be well. You add the water afterwards. Keep the emulsion as long as you want to, and when you want it, add the water. It can be made in any amount you wish, provided you keep the proportions right.

Mr. Edwards: How are you going to make this stick on the rose bushes? It will roll off. It has to be put on in mist form, or it will simply roll off.

Professor Sandsten: Well, you have to have some kind of spray pumps, you have to patronize the manufacturer of spray pumps. Any fruit grower that has not a spray pump is not a fruit grower. For the nurseryman whose stock is infested the best way is to put the emulsion into a pail and dip the top of the trees right into the emulsion; then he is sure of it and it is more economical.

Mr. Kellogg: How strong tobacco juice can you use for the same process?

Professor Sandsten: I am not familiar with tobacco decoctions, and I do not want to make any statements.

Mr. Kellogg: I use them effectively.

Mr. Edwards: Suppose you had half a million fruit trees, if you are going to dip every one, how long would it take?

Professor Sandsten: It would not take long. You have to do something for the big prices you are charging.

Mr. Edwards: What is the matter with having a barrel on an elevated car?

Professor Sandsten: Surely, in that sense you can get it on. You can get the barrel on a truck that furnishes the power from the axles on the truck; that sprays as fast as the horses can move, two rows at a time.

Mr. Kellogg: Does not the parasite take off these insects after two or three years?

Professor Sandsten: Yes, that is a point that should be emphasized. One class of insects will not hold its position for any length of time.

Mr. Kellogg: Except the potato bug.

Professor Sandsten: Well, the potato bug is not as bad as it used to be, it has its ups and downs like the rest of us, but an insect will not be bad for more than a few seasons, then other insects, smaller than the insect itself, will come and prey on it and eat it up or kill it at least. That is history of all insects of prey, they only last for a while.

The Secretary: The question is whether they will last long enough to kill our trees and plants.

Professor Sandsten: That is a good question.

Mr. Toole: There would not be so much money in fruit growing if it were not for these pests; it would be too easy to raise fruits and everybody could grow them, but as it is it requires some skill and some fighting ability to succeed.

Mr. Wilkins: I would like to ask if blight is a disease?

Professor Sandsten: Blight is a bacteria, just like consumption, belongs to the same class. It exudes on the substance and the spores are carried from tree to tree; it is a bacteria and not an insect.

The Secretary: I want to ask Professor Sandsten a question, possibly it was answered when I was not here, in regard to the cottony maple scale. I receive so many inquiries from members of the Society in regard to that scale, it is certainly abroad in the land now, you will find it on every maple tree. I would like to ask Professor Sandsten for my information: Is it practical and is it wise to attempt to spray a tree at the right time, or shall we simply let the scale go; will the scale kill the trees, or had we better attempt to fight it? There is a time, as I understand it, when we can spray very effectively for the cottony maple scale, that is when the insects hatch, but think what kind of a job it is to spray a tree 75 feet high. Shall we advise owners to spray with kerosene emulsion or whale oil soap, or let it go and let the natural enemies subdue them? It is a serious question with these valuable trees. I have a maple tree I value at $200 or $300; I know people in Madison who would not take $500 apiece for those trees that are badly infested by the cottony maple scale. When they come to you or to me, what shall we advise?

Professor Sandsten: My impression is, or my belief is, that they will not kill the maples, and if you feel like spraying, I would do it in the winter and not in the summer. I would take the saw and pruning knife and cut down a great portion of the tree and then go in with the spray pump and give them a good bath. Spraying at this time of the year or when the insects have hatched I think is too big a job and cannot be done effectively, it costs too much. I should risk it myself, and let the insect work its own way, and I should take my chances, with the help of the parasites and the climatic conditions, to kill it out or subdue it, or else, if I did not feel as if the insects are being exterminated, I should spray in the winter.

Miss Kate Smith: If a tree has been infested with the fungus for one year and then the next season you do not see any of it, is there any danger of the tree being infested again?

Professor Sandsten: Why yes. It is not a disease it is an insect, and the insect is apt to come again, but if they have disappeared in one year and you have no evidence of their being present again, why, you are practically free from them, perhaps free entirely, they might be killed; you need not worry about them until you found evidence.

Miss Smith: We have had trees where for one or two seasons they were badly infested, and next year they did not seem to be affected at all, or very little.

Professor Sandsten: I have had cases in Madison where you will find the old scale all along the twigs, the eggs did not appear and the old scale died. Now that was due perhaps to climatic conditions, or to parasite, which I do not know, probably both.

The President: We must pass on with our program to get through in time. This is the announcement that the Secretary has made, he savs "After lunch there will be a strawberry session, Mr. Geo. J. Kellogg and Mr. Hager will talk ten minutes."

NOTES FROM THE STRAWBERRY PATCH.

By GEO. J. KELLOGG.

Mr. President, Ladies and Fellow Horticulturists:

It is strange that one who knows so little about strawberries should always be set down for a paper on that subject.

I know less now than I ever did on the subject, and yet I have learned lots the past year. In last volume 1904, page 53, I gave a classified list of 62 varieties, partly from books, responsible writers and persons, best catalogues and my own experience.

How often we are deceived even by our best friends; I do not believe all our fruit men who publish catalogues, deliberately say some things that are not so, or would take money under false pretense, but of you could follow up the reports and failures of these exalted pets that get the highest praise, you will be led to believe in man's total depravity.

Friend Hartwell of Illinois, just writes me he has an acre in his trial station devoted to this work in strawberries and is often tempted to throw up the whole thing.

After growing strawberries for half a century I thought I would do something nice, so in February, 1903, I selected from the best catalogues fourteen of the most promising new kinds; I spared no pains in preparation. Planted each kind in two rows, side by side, one was trained "hedge row," the other 15 inches allowing plants not nearer than four inches, then all runners pulled, and the rows kept in just as nice shape as I knew how; wintered well, tended well, mulched heavy and all left on; now the result.

Cameron's Early, gave me the 1st berry; Warfield the 2d. Cameron is not "very early," *poor color,* small, soft, *worthless.* Catalogue said "good color, one of the very earliest;" but it is good for nothing in my trial, 1904.

Challenge made a great show for fruit, then every plant died down, while the rows either way, of other kinds, remained vigorous and healthy. Catalogue says it has a "great amount of vigor, deep rooted, stands drought remarkably well, beautiful." It is simply worthless.

Dornan (Uncle Jim), light color, soft, small and *worthless.* This came mixed with Jessie or Maximus, but I do not dispute that Dornan is true. Catalogue says "Dornan sells at double price in Chicago market. When all others are gone this steps in with its big beauties and captures the market." Can it be Jesse they call Dornan?

Woolverton, an old variety, I thought under "hedge row" treatment would pay, but it is worthless.

Sutherland, small, worthless. Catalogue says "large, delicious and productive."

Uncle Sam, small, light, unproductive, worthless.

Lester Lovett, same as Gaudy which does well in some places: this was worthless in hedge and half matted rows.

Oom Paul, a few big berries, neither handsome, good or productive; *worthless.* Catalogue says, "six to the quart, heavy yielder, it will not disappoint you."

Erine, late, brown, firm, worthless. Catalogue says "the coming berry, immense crop every year."

Texas, dirty yellow to brown, small, worthless. Catalogue says "dark, glossy red, deep red, medium to large."

Reasoner's No. 25 and 56 look like twins; they are not satisfactory.

Reasoner's No. 47, good size, pointed, light color, may do for near market.

The above thirteen kinds may be worth trial in favorable seasons and on favorable soil, but with the best I can do in a two years test, they will go under. I know the season has been unfavorable to color and crop, but if I had put in the old standard varieties I would have been one hundred dollars ahead.

Aroma, does not dissappoint me. It is the best, late, large berry of the 80 kinds I have in fruit. I mark this with x x x, firm, productive, good.

Midnight, has the best quality of the latest berries; it is in shape like Sample; fine color, firm, productive.

Sample is always shapely and good.

Klondike is mate to Bubach, though firm and a good shipper.

Velvet, of Chappel is remarkable for size, productiveness and color. It is of fair quality but not the best; texture will confine it to near market.

T. T. Lyons has good color, pointed, productive; mid-season to late, but I wish a better berry had been named for so good a man.

Marie, fair size, round, productive, good for home use and near market.

Monitor, Catalogue says "deep red;" it is a poor yellow and quite liable to frost; worthless.

Oregon Ironclad, is like Gladstone, or the same large, flat, irregular, white nose, product; medium to late, home use and near market.

Duncan, that "yields $1,400.00 to the acre." I failed to get and am out of pocket just $1,399.00 in consequence.

Wild Wonder I have at a dollar a plant and I sincerely hope it is not a humbug.

This paper of 24 kinds is worth $100.00 to any fool who is going into the strawberry business. I think it would have been worth more than that to me two years ago.

A friend of mine, an editor, preacher and amateur fruit grower, visited my garden, and after looking the kinds all over said he didn't know as much as he did before he came in. It may be the same with those who have listened to these notes from the patch.

DISCUSSION.

Mr. Moyle: I wish to ask if any one has ever raised what they call the Perpetual strawberry that bears several times through the year. The name I received was Vick's Perpetual. This is the first I have had of them this summer and they have blossomed and set out a few berries as large as wild strawberries.

Mr. Kellogg: The old Alton (?) strawberries have a few on all summer long, but there are never enough for a mess, I never saw them grow so you could get a pint at a time. The Enhance, of the old varieties, is one that has been playing havoc with strawberries in the neighborhood for a few years. If you have a wet season it will fruit clear into October.

Mr. Moyle: This that I got was claimed to be not at all like the Alton, but it was a perpetual berry, bearing right on the same plant the whole season through until frost came.

The President: What is the best berry; I was out.

Mr. Kellogg: The best late berry is the Midnight.

The President: I want the best commercial berry, whether it is late or early.

Mr. Kellogg: When you come right down to business, Dunlap and Warfield are the best two, there is no question about that. But if you want two late berries, take the Midnight low a joint, and should be from two to three inches in length, and should be planted in pots or boxes in clean sand.

Watering is very important. The plants should never be allowed to suffer from lack of water, nor should they be continually saturated. This applies not only to chrysanthemums but to most all house plants. Mr. Eben E. Rexford says: "Some persons water their plants every day, without regard to the season and give about the same quantity one day as they do another, the natural result is that in the winter their plants are weak and spindling, with yellow leaves and few, if any, flowers. In summer the evaporation of moisture from the soil is rapid, because of warmth and wind,' but in winter this goes on slowly and the amount of water given should be regulated by the ability of the soil to dispose of it, where too much is given the soil is reduced to a condition of muddiness, unless good drainage has been provided. Others will give water in little driblets, whenever they happen to think of it, the result is that their plants are chronic sufferers from lack of moisture at the roots. Turn them out of their pots and you will find that the upper portion of the soil is moist, and in this, what few roots there are, have spread themselves, while below it the soil is almost as dry as dust, and no roots could live there. Plants grown under these conditions are almost always dwarf and sickly, with but few leaves. You will find that plants grown under either conditions are much more subject to attacks of insects, than healthy plants are; when you do give water, give enough of it to thoroughly saturate the soil.

After the cuttings are rooted they can be potted into small pots and shifted into larger ones from time to time as they grow. Do not allow them to become pot bound until they are in the size of pots in which you want them to blossom. Good plants have been grown in 5 or 6 inch pots but usually 9 or 10 inch pots are better.

A suitable soil is a mixture of fibrous loam, leaf mold and well rotted manure in equal parts, with, perhaps, a quantity of pulverized charcoal and a sprinkling of bone meal, and a liberal quantity of sand, the whole mixed thoroughly before using.

When your plant has reached a height of 6 or 8 inches, pinch out the top to induce branching (unless you want only one blossom, one of those big fellows of which a plant can produce only one, and must be fed and forced for months to produce a mighty growth). Later pinch out the tips of the branches and repeat this until you have as many branches as you want flowers; bearing in mind always, that the size of the flowers will be in inverse ratio to their number. The pinching process should cease before the middle of August, as flower buds will be formed by this time at the tips of the branches, even though they are not apparent.

Plants may be grown to the bud producing stage either in pots or be planted in the garden as soon as danger of frost has passed. The former method gives earlier blossoms and avoids the shock of removal if planted out. The latter method insures a vigorous growth and more healthy foliage, if good culture is given. The plants must be carefully lifted with plenty of roots and shaded for a few days after potting.

August is the month to let the buds form; removing those that appear at the axils of the leaves. If but one large flower to a branch be desired, leave the first plump terminal bud; if this be removed, a cluster of terminal buds will follow, developing into a loose, fluffy, natural effect. Opinion is diverse as to which method is most desirable; it is wholly a matter of taste.

Give plants plenty of room and always plenty of water, turn them once a week to keep them in good shape. Feed them from now on with manure water (one pail full manure to a barrel of water). Do not have it too strong, use a half pint to a strong plant; weak ones should be fed more cautiously.

Manure water should never be applied when the soil is dry, as the crude manure is injurious to the rootlets. A soaking of pure water is necessary if the soil is in any way dry. It is then equally diffused through the soil, and each rootlet is nourished without injury.

Mulch the soil with tobacco stems to keep down aphis. Syringe with cold water and follow with tobacco tea to remove aphis when once established.

Soot water is also valuable to chrysanthemums in many ways.

It destroys worms that may collect in the soil, and by syringing the leaves with a clear solution of soot water they are made a dark, glossy green. A dose of lime water sweetens the soil and routes worms. Plenty of water and good drainage is the key to success.

HOW TO GROW CHRYSANTHEMUMS WITHOUT THE AID OF A GREENHOUSE.

MRS. D. D. HOWLETT.

Mr. President, Ladies and Gentlemen:

Your Secretary having asked to have a paper presented by our Society, the matter was brought up at our last meeting and I was chosen to prepare the paper. The subject: How to Grow Chrysanthemums Without the Aid of a Greenhouse, was suggested by Mr. Cranefield.

Although I am purely an amateur I have been quite successful in raising these flowers and will give you a few simple rules in regard to their culture, which, if followed, will insure success.

Contrary to the common opinion, it is possible to grow fine, even first class chrysanthemums without the aid of a greenhouse. The only time the chrysanthemum needs protection is when it is in bloom. The chrysanthemum is the latest to bloom of all the important outdoor flowers; and any flower is spoiled by a heavy frost even if the plant on which it is borne is unharmed.

There are several cheap devices for preserving the chrysanthemum during the critical period; and after this time the roots may be removed to the cellar to propagate from the following spring.

The first cost of raising chrysanthemums covers nearly everything for years; but it must be understood that if you would raise fine flowers you must bestow upon them both time and care. Obtain small plants or cuttings early in the spring and, as soon as danger of hard frost is passed, plant them in the garden beds from 1½ to 3 feet apart, according as you would have single stalk or large, bushy plants. Keep free from weeds and do not allow the earth about the roots to dry out, so that the leaves of the plant become wilted, for if this occurs frequently, the stems grow weak and the whole plant is stunted. Such plants will not produce fine flowers. If you wish to grow very large plants and great numbers of flowers, the plants should have rich soil, good cultivation, and should never be allowed to dry out; as the chrysanthemum is a "hard drinker" and feeder as well if you give it a chance. Also give the plants a place that has full exposure to the sunlight.

In raising large plants, the tops should be nipped out about four inches from the ground, early in the season; thus causing them to send up numerous strong shoots near the bottom. Stake the plants to keep them from being broken by the wind. To grow the largest blossoms it is necessary to throw all the floral energy of the plant into a single bud, consequently in such cases plant should be be kept to a single stalk.

Early in September the plants should be lifted carefully and placed in receptacles to correspond to their size. They should then be watered copiously and placed in a shady situation to remain until they somewhat recover from the shock of moving; which will be in four or five days. They may then be removed to the windows or protected by hot-bed sash for the top with sides of burlap or canvas, which may be rolled up during the day; but always keep in mind that they should have at least five hours' good sunshine during each day, and from the time of potting until blooms begin to open, they should be given liquid fertilizer from two to three times each week and should be sprayed with tea made from tobacco, to prevent the ravages of the black and the green fly. They should be dusted occasionally with flour or sulphur to prevent mildew.

Chrysanthemums need a great deal of care. Protection and expense may be reduced to a minimum, but it is impossible to grow really first class flowers without months of careful and intelligent work.

Though the selection of varieties is an important factor in success or failure, I can give you but the following small list from personal experience: White—Ivory, F. L. Atkins, Timothy Eaton, Minnie Wanamaker, Nellie Packet. Yellow—Col. D. Appleton, W. H. Lincoln, Golden Wedding, Maj. Bonnaffon. Pink—Pink Ivory, Mrs. Perrin, Viviand Morel, Louis Boehmer, Glory of the Pacific. Benj. Giroud is a beautiful deep red. Bronze Giant is what its name implies. I have raised flowers of this variety measuring six inches in diameter.

A few of the pompom varieties are very beautiful and it is much easier to successfully grow them than their giant sisters. There is no bother about disbudding; but the individual blossoms are only from one to two inches in diameter. Some of these little beauties bloom so profusely as to almost hide the foliage. A single well grown plant will often produce several hundred blooms. These are the little old-fashioned flowers of my childhood which were then called "artemisias." They are entirely hardy and belong to an entirely different class from the modern crysanthemum. The floral world has made such rapid strides as to almost lose sight of our old-time favorites; but as an old German once said to me, they are such "tankful flower," responding to all care, and thus repaying one for all work done for them, that we should remember them just a little.

DISCUSSION.

Mr. Moyle: I would like to ask at what stage of growth the lady would advise lifting the plants out of the garden and repotting them.

Mrs. Howlett: Well, before the buds begin to open at all. The buds will just begin to form at the time I should lift,—about the first of September. Some varieties are much earlier than others, and when I lifted mine I lifted them all at the same time, although some had buds the size of peas, and others did not show the buds.

Mr. Moyle: What do you set them in, tiles or boxes?

Mrs. Howlett: Yes, ten-inch boxes, but my plants are not so large. I have tiles for very large plants.

Mr. Moyle: In lifting these plants, would you advise watering the soil if it is a little dry, previous to lifting them, or does that make any difference?

Mrs. Howlett: I think I would if they were dry.

Mr. Moyle: Then I presume you would advise putting them in the shade?

Mrs. Howlett: Put them in a shady place until they are well established, inside of four or five days they will recover from the shock.

Mr. Rieck: If either of these ladies has treated hers with soap, I would like to know the quantity and how to apply it.

Mrs. Ihrig: The paper that I read was prepared by Mr. Phillipson and I cannot give you the quantity nor the manner of preparation. Perhaps Mr. Christensen can tell you.

Mr. Rieck: I have an idea that that soap is an important ingredient in the raising of plants. I know it has been used by experts with great success in the old country.

Mrs. Ihrig: Mr. Phillipson says, a clear solution of soap and water, I should imagine from that that the solution was allowed to set and only the top part of it used.

Mr. Rieck: How does this benefit the plant, is it for the insects on the top of the plant, or is it the chemical properties in regard to soil and growth?

Mrs. Ihrig: I think in both ways, and he says it gives a glossy green to the leaves. I think it is beneficial in both ways.

Mr. Moyle: I think there is one variety that has not been mentioned, that is a late variety, quite a prominent variety that I think comes from Germany, that was not mentioned, has any one grown that, or had any experience with it?

Mr. Everman: I have not had any experience with it, is it white?

Mr. Moyle: It is pink, comes very late.

Mr. Everman: The latest pink we have is the Murdoch, that is the latest we have grown in the pink. The latest white you can have at Christmas time, that is called the "Merry Christmas." That is a nice variety for a late bloomer, you can get it at Christmas.

The President: Has anybody else anything to offer on that strawberry question? Mr. Kellogg insists on my getting five men to talk five minutes.

Mr. Moyle: I will tell you what I have to say on strawberries in about three minutes. Mr. Kellogg said that the paper was worth $100 to any one fool who wanted to dabble in strawberries. Now that includes myself and the rest of us, that is a fact and we do not appreciate the value of this paper. You will not find one man in twenty states that does the systematic, thorough work that Mr. Kellogg does in the strawberry business. Sometimes he makes mistakes, as all of us do, but at the same time his reports are exceedingly valuable and I always appreciate them, and I am glad to hear Mr. Kellogg, I hope he will be long with us and we will have many more reports such as we have had today. There is nothing more essential than to have somebody give us an honest, conscientious report on strawberries, after having tried the new varieties that have been introduced and having determined their comparative merits, so I say, this report is of great value to us.

Mr. Kellogg: Tell us about your own self.

Mr. Moyle: Well, I do not feel like saying anything; when a man like Mr. Kellogg gets up and talks, we fellows have not got much to say. My strawberry crop is pretty small, it has been very dry this year.

Mr. Kellogg: Which stands it the best?

Mr. Moyle: Well, Brandywine at the present time is one of my best. It is a late berry that is getting on pretty well, and Bederwood, one of the best varieties is Bederwood, that seems to stand the drouth and is fruiting fairly well, although it is pretty nearly gone, but Bubach is another good one, it is a good bearer, but a shy plant maker, but we pin a great deal of faith on the Bubach. Lovett is another good variety, and Dunlap, as I stated last year—I said last year I thought the Dunlap was not what it was cracked up to be, but I will say today that I think it has come to stay. I do not think it will take the place of the Warfield, as many claimed it was going to do away with the Warfield entirely, but it will hold its shape as a commercial berry.

The President: Do you find it lighter in color?

Mr. Moyle: It is a trifle lighter in color than the Warfield. I do not think it is quite as firm as the Warfield.

The President: It will stand the drouth, will it not?

Mr. Moyle: I do not know but what it will; it will not yield quite as well as the Warfield, but it is a good running mate for the Warfield. Now I am fruiting a variety that I did not hear anything about at all, and that is the McKinley that I got several years ago; that has been fruiting for quite a while and appears to be quite desirable, good plant maker, strong grower and at the present time I have a great many seedlings. I grow a great many seedlings for my own amusement, and I have a good many seedlings of the McKinley at the present time and they are going to be valuable, at the same time I do not propose to introduce them unless they have a great deal of merit, but at the present time it has afforded me amusement to fruit them. They are upon the style of the Parker Earle, only they are a better plant maker, and the leaf is similar to that of the old Sharpless, I think probably it will compare with the Sharpless or Jessie, something of that nature, the leaf would indicate that.

Mr. Kellogg: Is not the McKinley identical with the Jessie?

Mr. Moyle: I think it is something similar.

Mr. Kellogg: Well, say it is the same.

Mr. Moyle: No, I won't say it is the same, the McKinley has a little neck to it. At the present time the Overt Jessie, the improved Jessie and the Clyde are planted largely around Racine.

Mr. Kellogg: It is all one kind, the Overt Jessie and the Jessie.

Mr. Moyle: Yes and they plant them with the Clyde, those two varieties are planted largely for the commercial market in that locality. And I think you will find if you go throughout the state, that different growers are making a specialty of some certain variety, think there is nothing like that. It is a matter of education, they are getting it in some varieties. Of course we have some that are a little stronger growers, better bearers than the average; in some places they grow the Brandywine, make a grand success of that, in other places they think it is absolutely worthless. There are some fine Brandywine on the table, elegant specimens, also the Bubachs, they are the largest berries on the table, probably, they had some rain, the conditions were just right. Mr. Kellogg, your berries would probably have been larger if you had had more moisture

Mr. Menn: What do you use as fertilizer?

Mr. Moyle: Nothing but good, healthy barnyard manure, that is the best fertilizer. I have come to the conclusion emphatically that a man ought to begin his strawberry bed a year and a half before he plants it. I am just beginning to wake up to that. With us it is almost folly to manure your land and plow it and spring plant, because if we have a little dry weather, —my soil is not that loose, friable soil, we cannot get a good stand, so my rule is to manure at this time, a little later, plow my soil and let it lie this summer, plow it again in the fall, then in the spring disc it and plant my plants early in the spring, then I get a good stand of plants, otherwise I get a poor stand and the patch is an aggravation all summer. I planted at one time on sod and I had a fine stand of plants, and I was an enthusiast, I planted on sod two years ago and the grub took all my plants. It is a risky business, sometimes you strike it all right, but it is something that ought not to be recommended, you want ground that has been broken up four years, otherwise it is full of grubs.

Mrs. Howlett: What is the best soil for strawberries, sandy or clay or black soil?

Mr. Moyle: If you keep the ground clean you can plant strawberries on any soil and get a good crop, I cannot recommend any one soil. Of course some strawberries do better than others on real low, flat soils, it will succeed where other varieties do not. The Warfield will grow on clay that is harder than Pharoah's heart and bear fairly well. Some varieties would not do a thing on that,, but I have seen Warfield grow on clay that was just like a road, and they bore well. The leaves would dry out and the berries would stick out, in the evening the leaves would come out a little, so they would go day after day in the dry season.

Mr. Rieck: Did you ever try wood ashes as fertilizer?

Mr. Moyle: Yes, when I was at the Station at Madison, Professor Goff decided that it would be advisable to put some wood ashes on the berries. We had a fine growth of plants and we thought potash would be a good thing to apply. I was a little green then, and I put the potash on with my hand and when I got through my hands were skinned, it was good strong ashes. We applied those ashes to the field, what the results were I am not in position to state. We generally use barnyard manure, all the ingredients, everything is found in good barnyard manure that is necessary I think. Of course in the East, New Jersey and that country, and New York, fertilizer is a very important factor in plant growing, strawberry growing, but any man in Wisconsin that has to use fertilizer must live in a poor part of the state; we can get all the barnyard manure we want and it is the best known fertilizer.

Mr. Kellogg: If you cannot get enough of it, use clover.

Mr. Rieck: Did you ever have any experience turning over clover sod the year before and turning it into a strawberry bed?

Mr. Moyle: Not much, I have had some, I cannot say that I advocate it extensively. Take any land that has been seeded down, even clover seed, you get more or less grubs in it, the grubs are there, and the roots also bother some and some clover is likely to come up and bother you.

Mr. Kellogg: I want to emphasize one point more on this strawberry question. I looked around to see if Mr. Edwards was here. This is the strawberry season of the year, we have had strawberries here but once since I came to the village, but we expect more, but if there is any time of the year that we want to take strawberries it is when they are on the table, and I want to emphasize the fact,—don't let them run wild, keep them in narrow rows, and yet when I grew them on a lot of about ten acres and let them get two feet wide, I at one time went in before breakfast picking five quarts without moving, squatted right down and picked five quarts; that same year a boy picked 230 quarts that worked by the day.

The President: One place?

Mr. Kellogg: One place, on five acres of continuous rows; we had about 25 pickers and the berries just rolled right out and tumbled out. Now I cannot do it with all the pains I have taken with this choice cultivation. It was because the season was right and the varieties were right, they were all old standbys that were good and were satisfactory, while half of these new varieties that I reported in my paper are good for nothing. I have been trying them and you want to profit by it. Go slow on new varieties, stick to the old ones that are paying you, don't care what anybody says.

Mr. Rieck: Isn't it true that a strawberry will do remarkably well in some neighborhoods and some kinds of soil and if you remove it even two miles from there it is a failure?

Mr. Kellogg: Yes, sometimes just over the fence.

Mr. Rieck: It depends then on the man who is raising it?

Mr. Kellogg: Yes.

Prof. Sandsten: We had the subject of fertilizers up for discussion, and I might add a few words. The effect of nitrogen, or the element that clover sod furnishes the soil is that of leaf growth more than that of berry growth, while potash and phosphoric acid are the ones that contribute to the growth of the fruit and the seed. Now potash is quite abundant in Wisconsin soil and the element that is perhaps most lacking is phosphoric acid, and in the strawberry growing sections in the East the strawberry growers always try to get a fertilizer that contains a high percentage of phosphoric acid, and clover sod will furnish nitrogen in abundance, and if the land is poor in phosphoric acid you will have a heavy leaf growth and a poor crop of berries. That is a point you want to bear in mind when you advocate clover sod.

Mr. Rieck: Did you ever see a big crop of berries grown without some leaves?

Prof. Sandsten: Surely, you have to have the whole combination, but you can have an abundance of leaves and not much fruit, that is the point I want to emphasize.

Mr. Christensen: I would like to ask Prof. Sandsten how he can apply the phosphoric acid and when?

Prof. Sandsten: The phosphoric acid can be applied in various forms. Now, for strawberries perhaps it is better not to use the acid. The South Carolina rock is dissolved phosphate rock, dissolved in phosphoric acid and it is acid. Now it is better to get the bone, dessicated bone, it is similar and it is not acid, and that ought to be applied in preference to the acid phosphate. The time of applying should be quite early in the spring, you should not wait until the berries are set, but before the time of blossom.

A Member· How do you apply nitrate of soda?

Prof. Sandsten: I apply it before setting the plant, distributing the fertilizer in the row where the plants are set. Or you may put it around the plant, but not too close; if you do it will injure the plant. Scratch it in lightly in the soil. If you get it too close to the plant it will burn the plant.

Mr. Rieck: If you are going to apply ashes to your plants, at what time would you do it, and how?

Prof. Sandsten: I would apply it in the spring, and I would scatter it just about the time the planting begins. You want to bear in mind that these commercial fertilizers are soluble in the soil and are taken up by the roots immediately, while barnyard manure is seldom soluble to the extent that commercial fertilizers are, and commercial fertilizers are acting more quickly, you can see the result of those at once. If you put on too much nitrate of soda it may injure the plant, and you can put on too much; the plant can only take up the soluble soil in a certain strength.

A Member: How much to a plant, a handful to the plant?

Prof. Sandsten: You would kill the plant; a teaspoonful would be an abundance. Even with that you want to remember that the amount of nitrogen taken up by the entire strawberry is not much more than 100 grains (?) and anything in excess of that may be waste.

The President: We will listen to the report of the judges.

LIST OF AWARDS AT SUMMER MEETING.

PROFESSIONAL LIST.

Flowers.

Display Pansies.

1st .... H. Christensen
2nd .... No entry

Display Stocks.

1st .... Wm. Toole
2nd .... No entry

Display Herbaceous Perennials.

1st .... Wm. Toole
2nd .... No entry

Display Roses.

1st .... Geo. J. Kellogg
2nd .... No entry

Display Moss Roses.

1st .... Mrs. J. J. Ihrig
2nd .... No entry

Display Native Ferns.

1st .... W. A. Toole
2nd .... No entry

Display Wild Flowers.

1st .... Mrs. D. D. Howlett
2nd .... Mrs. Marcia Howlett

Strawberries.

Bubach.

1st .... Mrs. J. J. Ihrig
2nd .... No entry

Clyde.

1st .... Geo. J. Kellogg
2nd .... No entry

Dunlap.

1st .... Joseph Ray
2nd .... Geo. J. Kellogg

Enhance.

1st .... Geo. J. Kellogg
2nd .... No entry

Gandy.

1st .... Geo. J. Kellogg
2nd .... No entry

Glen Mary.

1st .... Geo. J. Kellogg
2nd .... No entry

Jessie.

1st .... Joseph Ray
2nd .... Geo. J. Kellogg

Lovett.

1st .... Geo. J. Kellogg

Warfield.

1st .... Joseph Ray
2nd .... Geo. J. Kellogg

Collection (not less than 15 varieties).

1st .... Geo. J. Kellogg
2nd .... No entry

The following premiums were awarded on varieties not on list but admitted as meritorious:

Geo. J. Kellogg, 1st on Aroma, Midnight, New York, Klondike, Velvet, Gladstone, Maximus, Gibson, Marshall.

Joseph Ray, 1st on Sample, Brandywine.

NON-PROFESSIONAL LIST.

Herbaceous Perennials.

H. G. Selfridge (Fred Gebhardt Gardener) ....Diploma
Native Ferns, Greenhouse Ferns, Palms....................As Above

Display Roses.

J. J. Mitchell (A. J. Smith, gardener) ....Diploma

It was moved by Mr. Moyle, and carried, that a vote of thanks be extended by Mr. Selfridge and others for the special exhibits made by them.

Mr. Moyle: The strawberry exhibit by Mr. Kellogg ought to deserve special mention, because he took a great deal of pains to get it here and it is a very instructive display. The floral exhibit made by Mr. Toole is a very instructive lesson and very valuable to us. We think they all deserve a long mark for being here and making as fine an exhibit as they have.

Mr. Christensen: I think the vote of thanks ought to include the florists that have raised these plants and flowers.

Mr. Moyle: That was the understanding, that the gardeners be included, both the owners and the gardeners, particularly the gardeners that are interested.

The Secretary then gave the names of the exhibitors whose numbers only had been given by the awarding committee.

The Secretary: I wish to call your attention to certain remarkable specimens of vegetables from the grounds of Mr. Samuel W. Alierton, Mr. Madison is the gardener, and they are certainly very rmarkable in their line. I will say that we might have had a very extensive exhibit of orchids, ferns and palms, and other plants that would have nearly filled this room, if I had allowed the owner to send them over here from the greenouses of Mr. H. G. Selfridge. They were just preparing to load up three wagon loads which would have included several thousand dollars worth of plants, plants that were worth $200 or $300 apiece, but I would not allow them to bring them here, I feared some of them might suffer. I hope none of you will miss the opportunity to see those plants tomorrow, and I also hope sincerely that none of you will miss the opportunity to see the hybrid perpetual roses in bloom, thousands of plants and hundreds of varieties, it is the greatest sight I have ever seen in roses, not excepting the exhibit at Chicago; that is on the grounds of Mr. J. J. Mitchell that we will visit tomorrow, just across the lake here, I presume the finest collection of hybrid roses in the Northwest; we are invited to visit the grounds there.

WISCONSIN ORCHIDS.

ALETTA F. DEAN, PH. B., PH. M.

To many people the name *Orchid* conveys the idea of a flower rare, distant, and, excepting to the very rich, unattainable.

Indeed the story of the cost of some of the orchids seems to belong rather to fiction than fact. Within a few years in England Baron Schroeder has sold a unique variety of cypripedium for $1,825. A number of years ago I saw in the Massachusetts Horticultural Society exhibit an orchid belonging to Fred Ames for which he was said to have paid $1,500. It is probable that larger sums have been paid more often for single plants of orchids than for any other kind of plant. A thousand dollars for an orchid was not an uncommon price in the middle of the nineteenth century. The cost of obtaining them is so great both in money and human life, that the wonder is that they are so cheap. Many a man has spent months in dense jungles, risked and lost his health where he knew no white man was safe, held his life in his hands among unfriendly savages, all for the chance of finding some new kind. At the present time collectors are still engaged in searching the tropics, but striking novelties are now rarely discovered.

It is not so much the difficulty and danger that makes the orchid costly, as rarity or peculiarity. The cypripedium of Baron Schroeder was a variety raised in his own greenhouse, and some of the most costly have been hybrids produced with the utmost care.

About 400 genera are now known, comprising 3,000 or more species. They are almost all remarkable for the grotesque form of their roots or stems, or for the fragrance, brilliancy, and odd structure of the flowers. They are universally acknowledged to rank among the most singular and most varied forms in the vegetable kingdom. They are natives of nearly every part of the world.

The orchid seems to prefer the more interesting, or the more ornamental side of life. Not many of them condescend to be humbly useful, nor to lend themselves to the sordid demands of commerce. The salep of commerce is a nutritive substance something like sago, from the roots of an Asiatic orchid. Our flavoring, vanilla, is made from the fruit of a West Indian kind, and our common Putty-Root is said to be useful in mending broken dishes.

The interest in orchids is not declining. The work of hybridizing them is full of interest, and the possibility of obtaining a desirable new variety is an exciting one. Species run very true—there are few sports. A blossom produces a great abundance of seed. These facts ought to make it a valuable plant for the study of heredity. Nature must yield all her secrets in time. What qualities, what *classes* of qualities does a plant get from its seed-parent? What from its pollen-parent? What from its grand-parents? Why?

I have endeavored in some slight measure to make a study of heredity as shown in the orchid hybrids which have been produced in great abundance in recent years. And right here there is a complaint to make against horticulturists, even against that prince of them—Bailey—the author of our Cyclopedia of Horticulture. They publish no complete record of the wonderful results which they have achieved. Some do not keep such records at all. The pedigree of choice orchids is said to be kept as carefully as that of hunting-dogs, or of race-horses. But oh, what poor incomplete descriptions we find in the books, both of hybrids and of their parents, leaving us to *guess* at the hereditary tendencies and the real relationship!

If the habit of growth, and the shape and color of the orchid is interesting how much more so is its pollination! In most orchids the pollen grains cohere in masses. Here can be no dispersal by the wind, neither can the pollen drop upon the stigma of its own flower. Some moth or butterfly or unwilling bee must be persuaded to do the work, or it will not be done. This wonderful partnership of flower and insect Darwin long ago described.

This group—the orchids—make up the body of the aristocracy of the plant kingdom, the nobility, the oldest of the old families, and the most highly specialized. Their highest development was reached in some prehistoric age when they were the more dominant type. Perhaps they sprang from a common ancestry with the lilies. They continue to live in their ancestral homes. Other plants may roam but orchids stay firmly rooted in their original haunts, making the highest possible demands upon their environment. They are at once driven to the wall, however, when placed in competition with common flowers—weeds—or when conditions are changed for them, as in deforesting. They are highly characteristic in all their habits, in beauty, and in fragrance. They are the cultured among plants. They are not practical, not able to push their way in an every day world.

I have found people who did not know that at our very doors are growing many representatives of this family of rare and beautiful plants. According to Gray's *Manual* we have in the United States of the group Orchidaceae 17 genera, including 58 species. Of these the herbarium of the University of Wisconsin contains specimens of 13 genera, including 37 species, collected within the state. I have the one species of another genus growing within the state. The herbarium has every member of 6 of the genera. Of the 20 not yet reported for Wisconsin, 13 belong wholly to the eastern or southern states, leaving but 7 more which ought to be found in Wisconsin to complete the list.

No comprehensive American work on orchids has yet been published. I cannot give you the calendar of our Wisconsin orchids, but the majority of them are found in May and June.

Go out into our dark, damp woods, you who love Nature and her children, and there find many members of these F. F. N.—these *First Families of Nature*—these aristocrats.

Our earliest representative of one of these families is the Showy Orchis (Orchis spectabilis). It blossoms from early May to the middle of June, liking best the shade of hemlocks, and often growing in patches. It has two shining rich green oblong leaves, 3 to 5 inches long down near the ground. Between them rises the flower stalk 6 inches high, bearing a few handsome flowers with a deep pink hood and a pure white ovoid lip. It is well worthy of its name.

The Rattlesnake Plantain (Goodyera) everyone must have seen who has frequented the woods. It is a beautiful plant (too beautiful for its hideous name), though its claims to admiration are confined to the foliage. Its prostrate rosettes of exquisitely white reticulated leaves carpet many a shady nook. It has a dense spike of yellowish-white blossoms that appear from May to August.

The Coral-Root (Corallorhiza) has no green foliage and for that reason is classed with the saprophytes—plants that feed on decaying wood, moss, and leaves. It is one of the few orchid saprophytes that have been successfully cultivated. It has a brownish or yellowish stem, rather small, dull-colored flowers, and a queer mass of hard fleshy roots resembling coral, from which it gets its name. It grows in the damp woods or swamps.

Of the Sistera or Twayblade family we have specimens of but one member; we ought to have two. It gets its common name from the two opposite sessile leaves midway on the stem. It is a delicate little plant in woods and swamps with a short raceme of minute greenish-purple blossoms.

Another family—Siparis—is also called Twayblade, but here the two leaves are at the root. There are two children in this family and we have them both. The lily-leaved Twayblade lives in the woods. It is the more slender with a string of ten to twenty flowers. The lip is rather large, brown-purple, the other parts of the flower are greenish, or yellowish-white, narrow—thread-like, even, and bent backwards, resembling the sprawling legs of some insect. The other—the ovate-leaved, one—is from four to twelve inches high, with rather small yellowish-green flowers. It is more abundant than its sister and has chosen to live in moist grassy places in the open, instead of in the woods.

The Putty Root (Aplectrum) is a plant more curious than handsome. Its one oval ribbed or plaited leaf persists throughout the winter, arising from a corm (or solid bulb) which lasts two or three years before it shrivels, so that three or four are always found attached horizontally. Their sticky nature has given this plant the name. Others have called it Adam-and-Eve. The vigorous flower-stem is a foot or more tall and bears a loose raceme of rather large dingy greenish or brownish flowers, the lip sprinkled with purple dots. It is found in rich shady woods of maple and beech.

The most vigorous and progressive group as we know them in Wisconsin, is the Habenaria or Rein-Orchis family. Many of them are hardly conspicuous enough to have gained common names, but, widely distributed, they are present everywhere in the moister woodlands in our state. It remains for someone with a genius in that line to give us characteristic names for these humble cousins of the distinguished Calypso, Lady's Slipper and Orchis. The Habenarias nevertheless possess all the characteristics of the group, and although less attractive in color are none the less interesting to the true lover of flowers. Like poor relations, proverbially, the family is a large one and while Twayblade, Orchis and Coral-Root, have but few members, the Habenaria are a numerous progeny, there being no less than 13 children of this family of the orchids in our state. The most common here is the bracted Habenaria (H. bracteata) which bears its loose spike of small greenish-white flowers each with its long bracts, about the middle of May.

Habenaria orbiculata has two great glistening fluted leaves, sometimes as large as a dinner plate, spreading flat upon the mould, and surmounted by the slender leafless stalk with its terminal loose raceme of greenish-white bloom.

There are some Habenarias that are really beautiful—and noticeable enough to have won common names. They belong to the group of Fringed Orchids, which have the lip and often some other parts of the flower variously fringed and cut. This is well shown in the White Prairie Orchis (H. leucophaea). It is the largest of all this family, sometimes four feet tall. The blossom is large and one of the most delicately and deliciously scented of all our wild flowers. The blossoms are greenish-white in a long loose spike. The fan-shaped lip is many-cleft to the middle into a copious thread-like fringe. It is one of the few orchids that grow in our open prairies.

We ought to have in Wisconsin the one that is called the handsomest of the fringed ones—the Yellow Fringed Orchis, (H. ciliaris). So far it has seemed to stay its westward course in Michigan, but we may be able to claim it yet.

The Purple Fringed Orchis (H. psychodes) has a dense round spike of small, handsome, pink-purple fragrant blossoms. Its broad wedge-shaped lip is cleft into many short divisions.

A Habenaria that is well named is the Ragged Fringed Orchis (H. lacera). It is quite unnoticeable in its moist thickets. The greenish flowers with their narrow lip deeply parted into a long, ragged, hair-like fringe, are always objects of interest if not of beauty.

The beautiful White Fringed Orchis (H. blephariglottis) is a plant of the peat-bogs and borders of ponds, and is not often found. It is about a foot high, the flowers white and very beautiful, with the lip irregularly fringed.

A beautiful little plant, too dainty for its low boggy surroundings, is the Arethusa. It has no common name. It needs none. It does not belong to the common world. It is always a surprise to see its large fragrant rose-purple blossom airily perched on the top of its short stem, without a leaf at first, standing up from the black, boggy earth. Its lip is recurved and beautifully crested, and with its rosy, outspreading wings it seems, indeed, a being from fairyland.

The closely allied Calopogan—Grass Pink, some call it—differs from the Arethusa in its taller growth and brighter colors. It is about a foot high, 2 to 6 flowered, often three or four of the deep pink, almost purple flowers, opening at once. The dilated lip is bearded beautifully towards the summit with white, yellow, and purple, club-shaped hairs. The lip has a kind of hinge near its base, by means of which it easily moves up and down, or falls forward on the column. We are apt to think of orchids as inhabitants of deep, dark woods, but this, one of our most beautiful and representative members of the group, has a habitat widely different from the most that we have so far noted. You dwellers by our beautiful Wisconsin lakes, take a morning walk some day in June down where the sedges grow thinly on the sandy beach, and there you will find this delicate, slender, purple, water-loving orchid with its long grass-like leaves, growing in such profusion as to tint the view, and even to tempt the gatherer of bouquets.

The Pogonia is of similar habits but is less common. One of its Wisconsin children has been called Three-Birds from the shape of its dainty little fruit. It is a smaller plant than the Calopogon and on its one-leaved stem carries but a single small purple blossom with a crested lip.

Of Spiranthes, or Ladies' Tresses, we have in our herbarium specimens of three kinds, and one yet coming to us. It begins to blossom about the first of July and is one of the last flowers of the autumn. I used to find the little, waxy, sweet-scented, white blossoms in a little meadow adjoining our garden in Massachusetts, when I was a child, and I presisted in calling them "lilies-of-the-valley" long after I knew better. It is a pretty plant with its spike of white flowers winding spirally around the slender stem. It grows in open, moist land and sometimes persists in the meadows even after they have been cultivated. More adaptable than some of its aristocratic relatives, you see.

Of all our native orchids, the Cypripedium, Lady's Slipper, or Moccasin Flower, is perhaps, the general favorite, and the most widely known. This is probably because it is more frequently found and more conspicuous than the other families. Gray's *Manual* mentions six species and Wisconsin has them all.

The leafy stem of the Cypripedium called Ram's Head, bears an extremely odd blossom, whose small, reddish, veiny lip, prolonged into a short, blunt point, surmounted by curling petals which might suggest horns, seems to have proved the power of orchids to wake at the same time the imagination of the scientific and of the common mind, for the Latin name of this flower is *arietinum*, which also means, a ram.

The two yellow Lady's Slippers—the large (C. pubescens), and the small (C. parviflorum), bloom about the same time. They are the most common of the large orchids in this region. The children gather them in great quantities. The two are much alike. The larger is a more robust plant, sometimes two feet or more high. The lips of the two are nearly alike, though that of the larger seems more inclined to be flattened laterally. It is sometimes two inches long and nearly an inch broad. Its sepals are greenish while those of the smaller one are brown-purple. The smaller flower is quite fragrant, while the larger one is nearly odorless, and more solitary in its habits. The small one often grows in groups.

Our small white Lady's Slipper (Cypripedium candidum) is one of the shyest, daintiest, and most fragrant of its kind. It is only from three to ten inches high, and grows in open boggy, or wet grassy land, and sometimes in quite dry meadows among the violets. The foliage is light green. The lip is less than an inch long, white, striped with dark red inside which shows through giving the lip a faint rosy tinge. The base of the lip is stained with yellow, and its opening is bordered with a row of red dots. The rest of the flower is greenish, spotted with purple, the parts twisted and wavy, and the two petals long and ribbon-like.

The Stemless Lady's Slipper (C. acaule) begins to blossom about the middle of May. It often grows in clusters in quite dry, shady woods, preferably pine, often where there is no other undergrowth, and there it stands up stately and beautiful, making a fine showing. It has two large, plaited, downy, oblong leaves, ascending from the root. From between the leaves rises the flower stalk, 8 to 12 inches high, with a green bract at the top, arching over the one beautiful flower. The sepals and petals are greenish, veined and tinged with red. The lip is about two inches long, of a deep rose-purple, veined with lines of a deeper color. It is sac-like, and is cleft down its whole face, but with the edges turned inward and meeting. William Hamilton Gibson told in a very funny way of his experiment with a bumblebee. He caught the bee by the wings and thrust it into the sac through this front fissure. The bee could not get out again the way he went in, and after a time solaced himself with nectar which he found there. Then he started towards the two little openings which he saw at the top, under the stigma. He crowded through but his back, at last, came in contact with the sticky pollen. "A strange etiquette, this of the Cypripedium, which speeds its parting guest with a sticky plaster smeared all over its back." In the next blossom as the bee tried to leave, the stigma caught some of the stickky pollen, and thus the cross-pollination was accomplished.

The handsomest of this family, the Showy Lady's Slipper (C. spectabile) is the latest to bloom. The first time that I ever found it was July 11, in Aroostook county, Maine, growing in great abundance in a border of wet woods beside a well-traveled road. Here in southern Wisconsin I have found it as early as June 23. It is well worthy of its name. Its stem wrapped in pale green, downy leaves is two feet high or more, The sepals and petals are snowy white, and overhang the lip. The lip is wide in proportion to its length and of a waxy, much firmer texture than the other Cypripediums, and keeps fresh much longer when picked. It is of a beautiful rosy pink with broad pink stripes inside. There are on each stem two or three flowers, which have a most delightful fragrance.

The list is not exhausted, but I will tell the story of only one more orchid—the one I call the best of all.

I was out in the pine woods of Bayfield county one spring, near where a young woodsman was staying who, when he came into the woods, knew nothing whatever about flowers, scarcely knowing a milk-weed from a butter-cup, though later he grew so learned that he talked much about the "pectinately pinnatifid petals" of the Bishop's Cap, rolling the words "like a sweet morsel under his tongue" with an unction most moving. But one day in the early spring he tried to describe to me a flower which had attracted even his attention in the woods a mile or so away. I couldn't make out what it was from his description, so he went with me over logs, and through bushes and bogs, until we came upon a group of the dearest little flowers I thought I had even seen. There they were growing under the trees where the peat-moss was not very deep. Each had one little ovate green leaf standing up from the damp moss. The flower stem was three or four inches high, and bore on its top a single beautiful flower. The sepals and petals were a beautiful pale purple. The lip was about three-fourths of an inch long, dark purple, veined, with its apex forming two little horns.

The opening of the lip, towards the tip rolled outward, and was a rich yellow covered with short yellow hairs and having a few large purple dots. The inside of the lip showed a beautiful netted veining of purple lines on a lighter background. I hurried home and got out my botany. There it was—Calypso borealis. And the botany said "A beautiful and interesting plant in cold, mossy bogs, but *very rare.*" And I was happy.

I have kept but one blossom, and I have with that neither leaf nor bulb. Our University herbarium has no specimen of it at all.

I am afraid I have given you but little idea, if you do not already know them, of the beauty, the daintiness and the charm of these blossoms "on tiptoe for a flight." I can bid you only go seek them for yourselves, and then you will know.

"With memories of dainty things
That fluttered back and forth on wings,
And all that goes to swell the band
Of followers in fairyland;
A seedling thou, from fairy's bower,
Not quite content to be a flower."

MORNING SESSION. June 30.

The President: The subject this morning is the Wisconsin Horticultural Exhibit at the St. Louis Fair. You all probably understand what preparations have already been made on this exhibit and the arrangements for the exhibit itself. You understand that we have 1,275 square feet of surface, that we have 150 feet of table, and that 150 feet of table leaves unoccupied in the center quite a large space. Mr. J. L. Herbst was appointed to go and take care of it, but later tendered his resignation and did not want the position. It left me in a peculiar position, not knowing whom to go to, but I canvassed the matter in my mind and tried to think of somebody in the Society who would be at all likely to take that position of superintendent of the exhibit. Mr. A. A. Parsons of Omro was engaged in the rural mail route and to him I turned as being the only available man I could think of. Mr. Parsons at last concluded to undertake the job and went forward. I went to St. Louis on April 30th, on opening day and found there was nothing in position, our tables had arrived and were in place; they were made in St. Louis. We had arranged on the end of the table for a cranberry exhibit, that was not filled; there was no fruit on the table when I was there; they had not yet come there. New York, Indiana, Arkansas, West Virginia had some fruit on the table on opening day, perhaps a few other states, Nebraska, I think. When I came away I told Mr. Parsons to get it on as soon as he possibly could; everything being so incomplete, it was rather a problem. Later he did put on an exhibit. Since then Mr. Parsons has been laboring under one difficulty and another, and understanding something of the trouble there was there, it was thought best to send Mr. Marshall down and look the matter up. Mr. Marshall went last week and found some little difficulty. Mr. Parsons had been laboring under a misapprehension; he had been trying to save apples to be sure to have enough to conduct the exhibit further until we got new apples, and the cold storage people had not given him our apples, that is, they had not got down to all of the apples; he had been making calculations on what he had in sight, and he was rather scrimping the exhibit. The commission complained a little, perhaps they had a right to do so. Mr. Marshall went to work and they dug up 240 boxes of apples, more than Mr. Parsons knew that we had, so that at present Mr. Parsons has a chance of putting on 40 boxes of apples every week, making a very fine exhibit. We have 700 plates of apples, I believe, on the table now. The work of taking care of 150 feet of table and 700 plates of apples is considerable. Mr. Marshall says that Mr. Parsons and his wife are unable to take care of it properly. They have the cleanest exhibit in the building, but it is more than they can do and do what they think ought to be done, and there is not any question but what we will have to hire, or do something to supply added help. You must remember also, in passing, that we have used up $2,514 of our allotment of $5,000, and that we have only got the balance of the $5,000 to run the exhibit through the months after the new apples come. What we ought to look at this morning and consider more than anything else is the fact of getting fruits that are later in the season, when new apples come, and other things, at the least possible expense, because the Horticultural Society I believe has no other object in view than to make a creditable exhibit, an exhibit that will be creditable to the state and incidentally to the Horticultural Society. I believe that when the Duchess comes, that we ought to load up the tables with Duchess, the finest there is in the world; Wisconsin can raise them, and we want to make a special thing of the Duchess as long as they last. Later we want to make a special thing of the Northwestern Greening, and at a certain time we also want to make a special point of the Wealthy. Now I have got just to the limit of my ambition when I have said that much, because I know we can join in those particular departments. We ought not, perhaps, to neglect any other variety, but we can join in those three.

Mr. Toole spoke of the enthusiasm necessary for producing a creditable exhibit, and then an informal discussion was had as to varieties and ways and means of procuring the best ones for exhibition. The President then stated that the subject of the Trial Orchards would be taken up.

The Secretary: I shall be glad to answer any question, perhaps that is as good a way as I can put it in. I told the executive committee the other evening all that I knew, probably, about Poplar. I think we have a splendid site for an orchard; trees are doing better in that locality than they are at Eagle River or other places that I have visited. There is every prospect for success.

Mr. Kellogg: What is the site at Poplar, what is the elevation and the location.

The Secretary· It is high, well drained; we have a little trouble with water settling, but we run some furrows down the road, and I found, by-the-way, that the town officers are willing to co-operate with us and do everything they can. They have ditched the roadway so as to carry off all the water from the orchard, and it is a high, open spot; of course on three sides is unimproved land, woodland, on one side there is an open 40, an open field of 40 acres split up into several little farms, there are small patches, one man owns ten acres, another seven or eight. Back of our orchard are 15 or 20 acres more of cleared land and in front is the village of Poplar, that is open.

Mr. Kellogg: There is no timber protection around it?

The Secretary: Not close to the orchard; I do not believe we want it. The 15 acres that we have lies directly opposite Poplar, from the depot platform you can see our whole orchard site, with the exception of the old blacksmith shop that we spoke of the other evening, which will be removed. That land has been plowed for a couple of years. We have 4 inches of nice, loose, mellow soil, and the men who have farmed up there say that in new fields the soil becomes loose and mellow as soon as it is cultivated, but it has never been touched, never been broken before where we put those trees down, and while they told me that they were going to dry out, I have not worried about it, the reports that come show that I was right, the trees after the first season I know will be all right. You would be delighted with the appearance of the trees in that part of the country, fine healthy trees. Mr. Peterson has in front of his house a nice little orchard of his own that is very promising. The nurserymen were very kind; there were some extras that were sent up to Mr. Peterson as a partial recompense for the many kindnesses shown them. He is an excellent man and it is worth a great deal to have him there.

Mr. Menn: Are they subject to late spring frost?

The Secretary: I have not looked up the meteorological record, their season is much shorter than here. The last time when I was in Superior, when I left home the lilacs were in bloom in Madison, at Superior the leaf buds were just pushing, just coming into life, the season is three weeks or a month later in Superior than at Madison in the spring, and I expect a corresponding time earlier in the fall, that the season closes down, and there of course, like in all northern countries, the trees make their growth in less time, make a very rapid growth. You know in Alaska they mature many crops, but the growth comes in a few days.

The President: They told me they had a late fall.

The Secretary: That may be so, and they told me they have no drouth, as they have in southern Wisconsin. It does not take a lot of water in that country, the soil takes it all, it will not get away. I feel it is one of the best moves the Society ever made. Great credit is due the gentlemen who located that orchard.

Adjourned.

PART II.

Winter Meeting

Held at Madison, February 7—10, 1905.

PROGRAM.

TUESDAY, FEBRUARY 7TH.

9:00 A. M.

Annual Address by President.

Reports of Secretary, Treasurer, Corresponding Secretary, Delegates from Local Societies, Delegates to other State Societies.

2:00 P. M.

Reception of Delegates from other States.

Report of Superintendent of Trial Orchards.

The Wisconsin Fruit Exhibit at St. Louis, A. A. Parsons, Wm. Toole, J. J. Menn, W. S. Hager, L. G. Kellogg, Geo. J. Kellogg, T. E. Loope, S. H. Marshall, F. Cranefield.

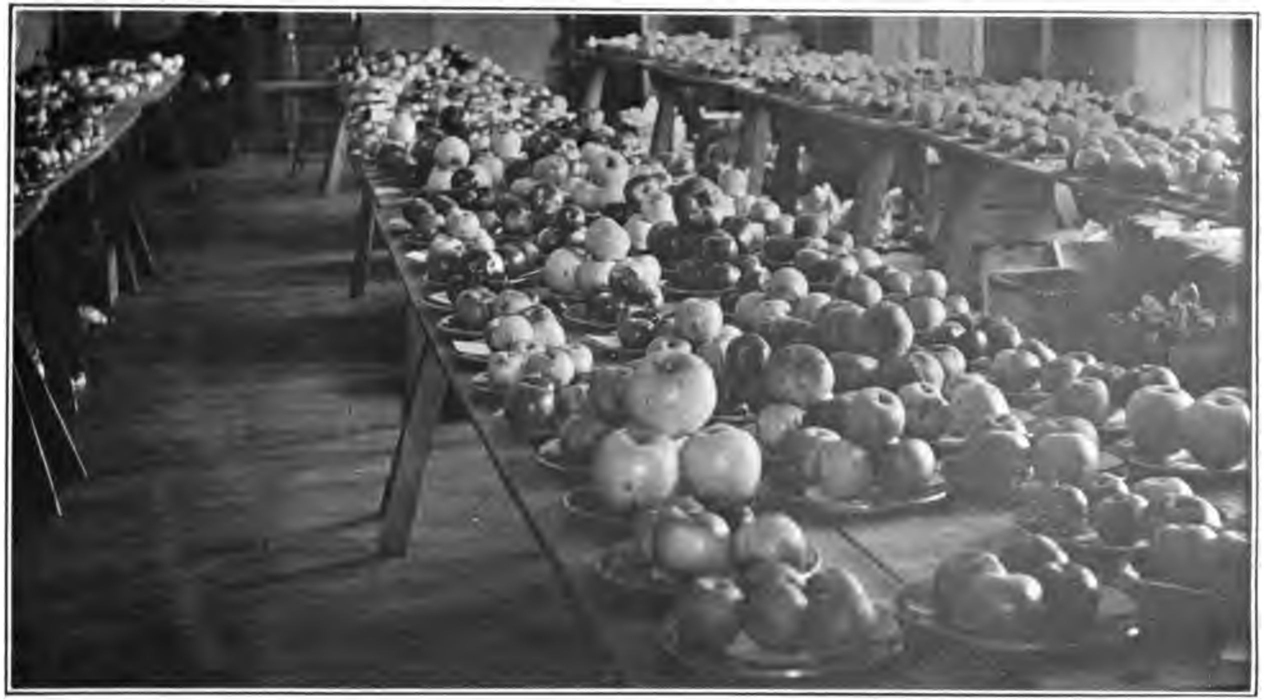
7:30 P. M.

Election of Officers and Members of the Executive Committee.

Buttercups, Miss A. F. Dean.

Something Interesting, Miss Mary Moyle.

PORTION (ABOUT HALF) OF THE FRUIT DISPLAY AT ANNUAL CONVENTION, MADISON, FEB. 7-9, 1905.



PORTION (ABOUT HALF) OF THE FRUIT DISPLAY AT ANNUAL CONVENTION, MADISON, FEB. 7-9, 1905.

WEDNESDAY, FEBRUARY 8TH.

8:30 A. M.

Small Fruit Culture in Vilas County, W. H. Adams.

Strawberry Experiences in 1904, C. L. Richardson.

The McMahon Apple (Its History), C. A. Hatch; Its Status in Chippewa County, C. L. Richardson; Winnebago County, T. E. Loope; Monroe County, J. J. Menn; Racine County, W. J. Moyle; Waukesha County, W. H. Steele.

1:30 P. M.

Exhibiting and Judging Fruits at County Fairs, Wm. Toole.

Market Gardening, Delbert Utter.

Marketing Fruits, J. A. Gaynor and H. B. Hotchkiss.

8:00 P. M.

Program by Students of the Horticultural Department of the University of Wisconsin.

THURSDAY, FEBRUARY 9TH.

8:30 A. M.

Cold Storage of Fruits, Prof. J. C. Blair.

Plant Breeding, Prof. E. P. Sandsten.

Native Medicinal Plants, Prof. R. H. Denniston.

2:00 P. M.

Elementary Facts Concerning Fungous Diseases, Prof. W. S. Brown.

Spraying, C. F. Hale, Shelby, Michigan, and A. V. Schermerhorn, Kimmundy, Illinois.

EVENING.

Banquet at Guild Hall, a social feature in which every member should join. Particulars will be announced at meeting.

FRIDAY, FEBRUARY 10TH.

8:30 A. M.

Services in Memory of J. S. Stickney, Address by Irving Smith.

Report of Committee on Revision of Constitution.

Unfinished Business.

PREMIUM LIST.

	1st. Prem.	2d. Prem.
1. Best Collection of Apples, not less than 10 and not more than 25 varieties (3d Prem. $5.00)	$ 25 00	$ 10 00
2. Best 4 Varieties Winter Apples for market; quality, hardiness, productiveness and keeping qualities to be considered	5 00	2 50
3. Best 3 Varieties Winter Apples for family use; qualifications as above	3 00	1 50
4. Best New Apple named and in bearing at least 5 years but not on society fruit list	3 00	1 50
5. Best Seedling Apple	5 00	2 50
Best Plate Bailey	1 50	75
Best Plate Ben Davis	1 50	75
Best Plate Fameuse	1 50	75
Best Plate Gano	1 50	75
Best Plate Golden Russett	1 50	75
Best Plate Grimes' Golden	1 50	75
Best Plate Longfield	1 50	75
Best Plate Malinda	1 50	75
Best Plate Newell	1 50	75
Best Plate Northwestern Greening	2 00	1 00
Best Plate Patten Greening	1 50	75
Best Plate Perry Russett	1 50	75
Best Plate Pewaukee	1 50	75
Best Plate Scott Winter	1 50	75
Best Plate Tolman	1 50	75
Best Plate Wealthy	2 00	1 00
Best Plate Windsor	1 50	75
Best Exhibit Cranberries	10 00	5 00

RULES OF ENTRY.

I. All entries must be filed with the Secretary before 12:00 o'clock Tuesday, February 7th.

II. Fruit must be arranged ready for Judges by 1:00 p. m. February 7th.

III. Four apples constitute a plate, no more no less.

IV. A variety may be entered for two or more premiums, but separate samples (4) must be furnished for each entry, except for No. 1, which may include all entries.

V. All of above to apply to both regular and special premiums.

VI. Exhibitors for regular premiums must be members of the Society.

Members or others unable to attend the meeting may send fruit to the Secretary who will make entries and place fruit on exhibition. Persons not members should remit $1.00 for annual membership except for special premiums.

The above rules will be strictly observed.

For further information address:

F. C. CRANEFIELD, Secretary,
Madison, Wisconsin.

PROCEEDINGS OF THE ANNUAL MEETING

OF THE

WISCONSIN STATE HORTICULTURAL SOCIETY

Held at Madison, February 7-10, 1905.

The annual meeting of the Society was called to order in Guild Hall, at 10 o'clock on the morning of February 7, by the President, Dr. T. E. Loope.

After an invocation had been offered, the "Annual Address of the President" was presented by Dr. Loope. (See index.)

The "Annual Report of the Secretary" was then submitted by Mr. Frederic Cranefield, followed by a supplementary financial report. (See index.)

Mr. L. G. Kellogg presented the "Treasurer's Report," and the "Report of the Corresponding Secretary" was submitted by Mr. William Toole, Jr. (See index.)

There being no objection, the reports of these officers were referred to the Finance Committee.

The reports of delegates of local societies were then called for and responded as follows:

"Report of Omro Horticultural Society," Mrs. Jos. D. Treleven. (See index.)

"Report of the Algoma Horticultural Society," M. V. Spurbeck. (See index.)

"Report of the Eau Claire Horticultural Society," Mr. H. B. Hotchkiss. (See index.)

"Report of the Brown County Horticultural Society," W. S. Hager. (See index.)

"Report of the Lake Mills Horticultural Society," Geo. J. Kellogg. (See index.)

Dr. T. E. Loope then submitted the "Report of Delegate to the Northern Illinois Horticultural Society." (See index.)

The President: We will hear from Mr. Philips who represents societies all over the United States. I wrote to Mr. Philips that he could be a delegate to some society. I think I left a blank space for the name of the society and he filled it in with Minnesota, Iowa, North Dakota, and some other places. (Laughter.) I think I had appointed Mr. Moyle as delegate to Des Moines, and we would be glad to hear from him.

Mr. W. J. Moyle then presented the "Report of the Delegate to the Iowa Horticultural Society." (See index.)

Mr. Richardson then presented the report of the delegate to the Illinois Horticultural Society. (See index.)

On motion of Mr. L. G. Kellogg the meeting adjourned.

TUESDAY—AFTERNOON SESSION.

The meeting was called to order at 2:30 by President Loope.

The President: The first order of business this afternoon is the reception of delegates from other states. I understand we have with us Mr. Underwood of Minnesota. We would like to have Mr. Underwood come forward and make us a speech.

Mr. Roy Underwood (Lake City, Minn.). Mr. President and Members of the Wisconsin Horticultural Society, I assure you it is with great pleasure I find it possible to meet with you today, and it is the first time I have had that pleasure. My father, I think, has been here several times in the past, and he has always reported such an agreeable and profitable time had in meeting with you that I feel myself more than ever happy to find myself a delegate among you. Those of you who are familiar with the language of the race track will recall the term often used that a race was "won by a scratch," and my presence here is due to something similar. I believe at our recent convention our Society appointed some one older and more dignified, some one of our older members with gray whiskers and experience, but at the last moment, at the eleventh hour it was found impossible for him to attend, and our Secretary, Mr. Latham, telephoned me and asked me to come down here. I expressed doubt as to my ability to represent our Society as it should be represented, but said I would come and do the best I could. Although I have been brought up in a horticultural atmosphere from infancy, you might say I have been in the tree business all my life, yet at the same time I am willing to confess I feel I have a great deal to learn yet. In fact, I think any of us who have taken up horticulture as a vocation, especially here in the northwest, feel the force of the fact that we all have much to learn yet, not only in our method of culture, but in the varieties and in the adaptation of varieties to our soil and climate. I was very much impressed and happy to think that I got here in time this morning to hear the glowing tribute of your President and others paid to our Minnesota seedling apples. We are very proud of our state in horticultural matters. We are very proud of the effort Wisconsin and Minnesota have been making in the production of varieties suited to this climate, and in that labor I think we have a community of interest in our two states, Wisconsin and Minnesota, a community of interest that will always obtain because of our similar climate, similar soil and other conditions. I think the result of this effort in horticultural work in Wisconsin and Minnesota must have its effect in other states, and we can certainly have this feeling that a vast amount of good is passing back and forth whatever the knowledge, whatever the success which may attend toward that end. Minnesota has, as many or all of you know, offered a thousand dollar prize for the purpose of bringing out some good, long keeping, winter apple, that would be hardy in this latitude, and I have no doubt that as time goes on we will discover something that will come close to meeting the requirements. There are other fruits that should be developed along the same line. The plum in particular is indigenous to this northern climate, even more than is the apple, and there is no reason why we should not produce a plum hardy in this country and that has the qualities of the domestic and perhaps other plums offered on the market. Perhaps we should also produce a cherry that would be at least as good as the Early Richmond and as hardy.

A great many people who live on the lake and in favored parts of Wisconsin are able, I see by your fruit exhibit, to grow fruits which we have not been able to grow in Minnesota, and which your people in northern Wisconsin and in the western part of the state have not been able to grow. So I take it that a good majority of your members are also interested in the production of what we call strictly hardy, or ironclad fruits, something that will give us fruit in the less temperate parts of the state.

I do not know that I have anything to offer you personally. The remarks I made about my feeling of incompetence were made to forestall you if you should wish to pump me in regard to horticultural matters later. I assure you I am here more than anything else for the purpose of bringing you the hearty good will of our Minnesota Horticultural Society and to extend to you a cordial invitation to attend our meetings. We have our annual meeting the first Tuesday in December and our summer meeting in June, and while we have had the pleasure in the past of meeting a number of your members, whom we shall always be glad to see, we hope in the future we shall see many new ones, and we shall always regard it as a pleasure to meet you either here or in our own Society. I thank you for your cordial reception, and trust the meeting will be profitable to all and especially to the horticultural interests of your state. I thank you.

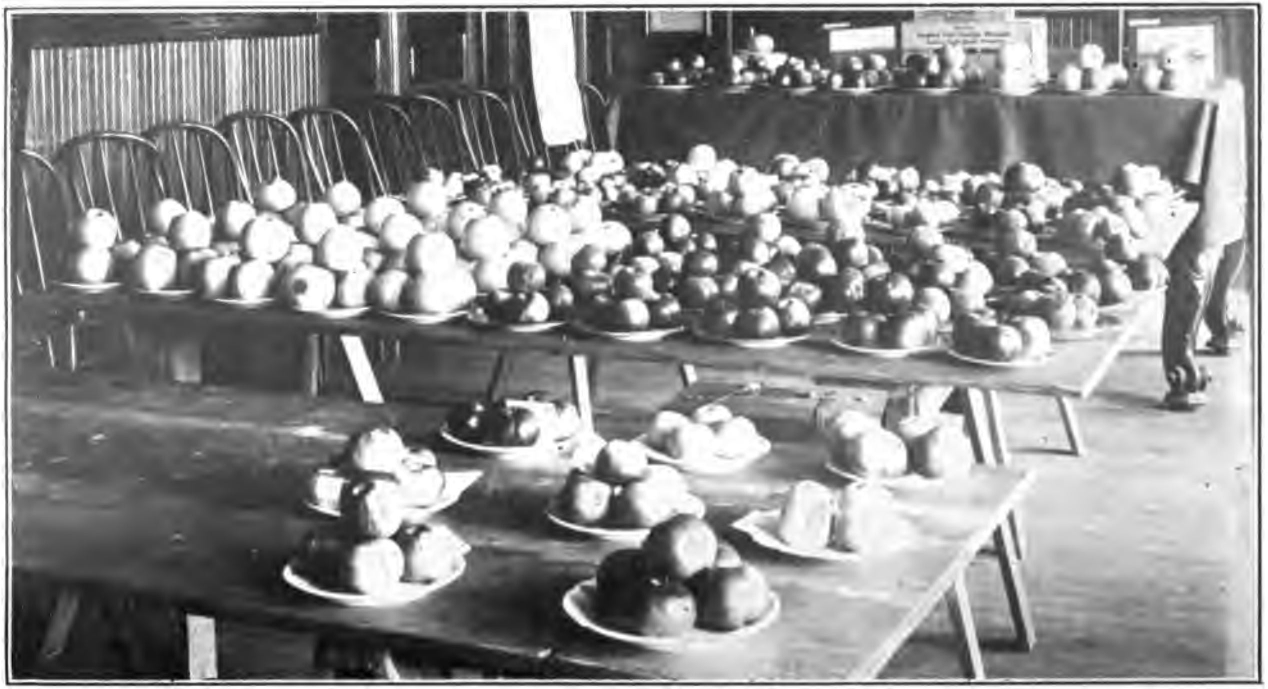
Mr. A. J. Philips: I take pleasure in introducing Mr. W. A. Anderson, of West Union, Iowa, who is the delegate sent here by the Northeastern Iowa Horticultural Society.

Mr. W. A. Anderson (Iowa): Mr. President, I am no speaker, and I don't think I can do justice to the occasion, especially not in following such an eloquent speaker as we have just heard. I am at a disadvantage in that respect. I am glad I have had the pleasure of meeting you here, and to come over here and learn that my experience has been yours. Mr. Underwood has grown up in the business and confesses that he has yet much to learn, while I had attained some age before I took up horticultural pursuits, and yet his experience is greater than mine. I did some studying before I commenced to grow fruit by reading the reports of our State Horticultural Society, and I think Iowa feels indebted to Wisconsin for her apples, because a great many of our hardy varieties were grown from Wisconsin seedlings, the McMahan, Wolf River, Plumb Cider, Pewaukee, and others which we consider among our best varieties. The Patten Greening is about the only one we have of our own, and some do not recommend that. It is recommended in Minnesota, but at home it is grown by the nurseries mostly. When it comes to native plums Iowa feels she can hold her own with other states. We have a number of varieties that can be put on the market.

I will not take up any more of your time. I came here to express to you our good will, and to express the hope than many of you will feel like attending our meetings. I am very much obliged to you for the kind reception you have accorded me.

Mr. A. J. Philips: I now take pleasure in introducing to you Mr. Chas. Hay, of Dixon, Ill., who represents the Northern Illinois Horticultural Society.

Mr. Chas. Hay: I am not a talker. It took me a long time when I was a little fellow to learn to talk at all, and even at this time to get up before an intelligent audience such as I see before me, is rather embarrassing. This is my first trip abroad, and, as Mark Twain says in his "Innocents Abroad," he said a good many things that were left unsaid, and so you must consider that I shall leave a good many things unsaid. We have a society down there and feel proud of it, but when be buck up against the Wisconsin Society we feel like children, we feel that you can be our teachers. I have been in the horticultural business only a short time, possibly six years, but in a way I have been identified with the Northern Illinois Society somewhat longer. It was through being identified with that society I became interested in horticulture and I am doing business now on a larger scale, and I came here to bring you the greetings and convey the good will of our Society and to express my pleasure in meeting with you here as a delegate from our Society. I trust we may meet each other oftener, and I know, so far as I am concerned, I shall derive great benefit



SECTION OF FRUIT DISPLAY, ANNUAL CONVENTION, 1905.

All except eight plates in foreground exhibit of Dr. T. E. Loope.

NORTHWESTERN GREENING AND WEALTHY.

Exhibited by Dr. T. E. Loope, Annual Convention, 1905.

from this interchange of visits. This is about all I can say at this time.

The President: Is there anybody else here from outside of the state. I see Mr. Schermerhorn in the back part of the room. We want him to come forward and show himself and make us a speech.

Mr. A. V. Schermerhorn (Kinmundy, Ill.): I am very glad to be with you. We are very proud of our "Sucker State" down there. You grow some fine strawberries up here and those Michigan fellows grow some fine strawberries. This Warfield has been a great success. Is there any other variety that does better with you than the Warfield? (Cries of "Senator Dunlap," and "Splendid.") The Warfield originated within fifteen miles of where I live. That is about all we can brag about. The Splendid is a splendid failure in our country. It may be a splendid success up here, but in our section of country it is a failure. It is a miserable failure in our section of country.

I just got in here a few minutes ago and the first thing I made for was your fruit exhibit up stairs. I saw something similar at Traverse City, Michigan, last winter. You fellows may think we don't raise any apples fit to eat in southern Illinois because you hear so much about the Ben Davis. I will never go back on the Ben Davis, but we do raise some fine apples, such as the Jonathan, Grimes' Golden, and such fruit as that, they nearly top the market. We are in the fruit business as a business where I live. There are thousands of orchards in that section. To give you a little bit of an idea about orchard conditions down here, I want to tell you that in the year 1902 there were four counties that suffered a loss from fungous disease in round numbers of $1,500,000. We had two of the most peculiar seasons that section of the country has ever seen. In 1903, one night did us up. The thermometer got way down, I don't know how far it got down but it got down far enough to get away with all the apples. Last year we had six or eight days of temperature so low that the sap would not circulate; everything stood still, hardly a leaf stirred, the sap would not circulate, and the apples, after they had been fertilized, perished for want of nourishment. I have been there six or seven years and I never experienced such conditions before. That 1902 crop was a total failure. I was talking with Senator Dunlap, who is the originator of the Senator Dunlap strawberry, and I think he is interested in a larger area of orchards in the state than any other man, and I consider him an authority on the subject of growing apples in Illinois. I was talking with him about apples last spring, and asked him if in his judgment he did not think the neglect of spraying orchards this last year to stop the ravages of the apple scab fungus was not a greater loss in those four named counties than they suffered from the bitter rot, and he said he thought it was exceeded by at least one-half. I don't know how apple scab fungus is up here, but in southern Illinois it does us more injury than all of the bugs, bitter rot and other fungus diseases put together. The damage done by those things will not compare with the damage done by the apple scab fungus. You can control it the easiest thing in the world. I will try to tell you how when I get to read my paper. I would like to know what you consider one of your worst enemies in this country. I know it is bad in Michigan; I heard a good deal about it in Michigan.

The President: It is not so bad here except on certain varieties.

Mr. Schermerhorn: Is it not worse in certain localities?

The President: I don't know of any localities where it is more destructive than in others.

Mr. Schermerhorn: I want to know how much you are interested in the spraying proposition. You brought me up here four hundred miles to talk to you about spraying, and I want to know whether you are interested or not. It is a business proposition to have a good time and I want to get something out of this trip. I want to know what you spray for. What are your worst enemies? What is your worst insect pest? What are you spraying for? There is no use in spraying unless you know what you are spraying for.

Mr. Geo. J. Kellogg: Codling moth and curculio.

Mr. Schermerhorn: The curculio is a hard proposition. I am very glad to meet with you and I am sure thus far I have been wonderfully entertained, especially down here at the hotel. We would be very glad to meet you at our state meeting or any one of our district meetings. I thank you for your attention.

On motion of Mr. W. P. Bussey, Mr. Schermerhorn was made an honorary annual member.

The President: I want to call on Mr. Richmond of La-Crosse for a few words.

Mr. H. G. Richmond (La Crosse): Mr. President, Ladies and Gentlemen, I am not exactly outside of the state, but I am so near it that I can see the Minnesota bluffs across the river. I come from the western part of the state. I should have been here this morning according to the program to make a report of the La Crosse county society, but I have been unavoidably detained, and through the courtesy of your President I am permitted to take your time this afternoon for the purpose of making such a report.

Mr. H. G. Richmond then submitted the "Report of the La-Crosse County Horticultural Society." (See index.)

Mr. Richmond: I was somewhat pleased to meet one familiar face here today, and that was the face of my friend Philips. He has been with us a good many times, and if I were not Scotch and a Presbyterian, and we are pretty strict about what we say, I should say that has nothing to do with the truth. It is all true.

The President: I would like to find the place where Mr. Philips has not been. (Laughter.)

The President then introduced to the audience Mr. J. V. Buckland of Ringwood, and Mr. H. G. Street of Hebron, Illinois.

On motion of Mr. H. P. Bussey the gentlemen were made honorary annual members of the Society.

The President: The next matter to take up is the report of trial orchards by the Secretary.

A "Report on Trial Orchards" was then submitted by the Secretary, Prof. Cranefield. (See index.)

Mr. S. H. Marshall: We have with us this afternoon Mr. Lewis, the delegate from our local Madison Horticultural Society, from whom we would like to hear.

Mr. H. M. Lewis presented a brief verbal "Report of the Madison Horticultural Society."

The President: We will now hear reports on the fruit exhibit at the World's Fair at St. Louis.

Reports of "The Wisconsin Fruit Exhibits at St. Louis" were then submitted by Messrs. A. A. Parsons, Wm. Toole, J. J. Menn, W. S. Hager, L. G. Kellogg, Geo. J. Kellogg, T. E. Loope, S. H. Marshall and Frederic Cranefield. (See index.)

The President: I wish to say that the Revision Committee consists of Messrs. Cranefield, Moyle and Marshall.

To nominate the Executive Committee, Messrs. Marshall, Toole and Coe.

Judges of Fruit, L. G. Kellogg and M. E. Hinckley.

On motion of Mr. Parsons a vote of thanks was extended by the Society to Prof. Stinson for his courtesy to the representatives of the Wisconsin Horticultural Society at the World's Fair, with instructions to the Secretary to inform Prof. Stinson of the action so taken.

On motion of Mr. Moyle the meeting adjourned.

TUESDAY—EVENING SESSION.

The meeting was called to order by President Loope at 8:30 o'clock.

The President: I think the first order of business this evening is the election of officers.

The following officers were elected for the ensuing year: President, T. E. Loope; Vice President, Geo. J. Kellogg; Treasurer, L. G. Kellogg; Secretary, F. Cranefield.

The President: We are now ready to hear the report of the nominating committee, but before that report is made I would like to say a word. We have at present a very efficient Corresponding Secretary, but I understand he does not wish to serve any longer. I also understand there is a resolution to be brought before the Society to do away with the office of Corresponding Secretary. It does not amount to much only under certain conditions, and if there is no objection we will hold that matter open until after the report of the committee on revision of the constitution is made, and if you then see fit to continue that office we will elect someone to fill the place. Otherwise my impression is they will want to cut that office out entirely. Mr. Toole does not want it any longer and I guess there is nobody else that wants it either.

Mr. S. H. Marshall: I would like to make the report of the nominating committee at this time. Your committee appointed to nominate these officers would place in nomination the following names as members of the executive committee:

First district—W. J. Moyle, Union Grove.
Second district—S. H. Marshall, Madison.
Third district—Wm. Toole, Baraboo.
Fourth district—Arthur Wright, Milwaukee.
Fifth district—F. W. Harland, Waukesha.
Sixth district—L. A. Carpenter, Fond du Lac.
Seventh district—J. J. Menn, Norwalk.
Eighth district—W. P. Bussey, Omro.
Ninth district—Irving Smith, Green Bay.
Tenth district—Prof. R. B. Johns, Wausau.
Eleventh district—C. L. Richardson, Chippewa Falls.

On motion of Mr. Geo. J. Kellogg, the report of the committee was adopted.

On motion of Mr. L. G. Kellogg, the Secretary was instructed to cast the ballot of the society in favor of the nominees as members of the executive committee.

The audience was then regaled with music by the Lyric Club of Madison.

The President: This finishes our business session and we will now take up the papers that are on our program for this evening. I will first call on Miss Dean.

Miss A. F. Dean in an excellent paper presented "The Buttercup Family of Wisconsin." (See index.)

The Secretary: Mr. President, Ladies and Gentlemen, as you will notice there is one other number on the program this evening, a paper by Miss Moyle, but as she is in attendance on the alumni banquet we cannot have her paper this evening. Perhaps we might as well quit now, but I thought in order to fill out the program I might show you a few views of farm homes, and some views of trees and shrubs that were loaned to me through the kindness of Prof. Sandsten of the Experiment Station. If you are willing to stay I am willing to talk to you and show you a few pictures. You must not expect me to talk too much because it is not in the nature of a lecture, I simply want to show you a few pictures that may be of interest to you.

Mr. Cranefield then entertained the audience with a number of views relating mostly to the proper and improper method of planting in landscape gardening.

At the conclusion of the talk the meeting was declared adjourned.

WEDNESDAY—MORNING SESSION.

The meeting was called to order by the President at 9:15 o'clock.

The President: We have no business before us this morning, so we will take up the regular program. The program this morning is on the subject of Small Fruit Culture, and I will call on Mr. Adams who has the first number on the program.

Mr. W. H. Adams then read a paper on the subject of "Small Fruit Culture in Vilas County." (See index.)

The President: There is a young man here who can give us a good deal of information on strawberry culture, and I am going to call on Mr. Richardson.

Mr. C. L. Richardson then read a paper detailing "Strawberry Experiences in 1904." (See index.)

The President: We have another paper along this same line which will be presented by Mr. Hager.

Mr. W. S. Hager read a paper also on the subject of "Strawberry Experiences." (See index.)

The President: This discussion we have had has been very interesting, but we must close it and give way to the McMahan apple. Mr. C. A. Hatch will give the history of the McMahan apple.

Mr. C. A. Hatch then presented a paper upon the subject "The McMahan Apple—Its History." (See index.)

This paper was followed by a report of the status of the McMahan apple by the following gentlemen as representing their respective counties: C. L. Richardson, Chippewa; T. E. Loope, Winnebago; J. J. Menn, Monroe; W. J. Moyle, Racine, and W. H. Steele, Waukesha county.

On motion of Mr. Moyle, the meeting adjourned.

WEDNESDAY—AFTERNOON SESSION.

The meeting was called to order at 2 o'clock by President Loope.

The President: We passed over something last evening that we will take up this afternoon. I want to call upon Miss Moyle, and I am sure she will give us something interesting.

Miss Mary Moyle then read a paper that contained "Something Interesting." (See index.)

The President: We have with us here a gentleman from Iowa from whom we would like to hear a few words. Mr. Hinckley will you come forward?

Mr. Hinckley (Iowa): Mr. Chairman, I feel at home here because my early life was spent in your state. Iowa sends greeting to you. Iowa is not only proud of what she is doing, but she is proud of what Wisconsin is doing, especially in the way of raising seedling apples. I hope to become better acquainted with you before the close of this meeting.

On motion of Mr. H. P. Bussey, Mr. Hinckley was made an honorary member of the Society for one year.

The President: We will now take up the program as laid out for the afternoon, and the first number is by Mr. Utter.

Mr. Delbert Utter submitted a paper on the topic of "Market Gardening." (See index.)

The President: The next topic on the program is on the subject of judging fruits, upon which Mr. Toole will speak.

Mr. Wm. Toole then addressed the society on the subject of "Exhibiting and Judging Fruits at County Fairs." (See index.)

Prof. Sandsten: I would like to ask whether this Society has any rules for judging fruit.

The President: No, we have no rules.

Prof. Sandsten: I will move then that a committee of three be appointed to draft rules for judging fruit.

Mr. Wm. Toole: The object and need is so evident that I don't think we need spend any time in discussing the question. The only thing I could suggest that someone with a good command of language might make it a little more emphatic.

Prof. Sandsten's motion was duly seconded, and, being put to a vote, prevailed unanimously.

The President: I will appoint that committee a little later in the session.

The President: We now come to a subject in which everybody is interested, that of marketing fruit. Judge Gaynor and Mr. Hotchkiss will speak to us on this subject.

Judge J. A. Gaynor and Mr. H. B. Hotchkiss then each read a paper on the subject of "Marketing Fruits." (See index.)

WEDNESDAY--EVENING SESSION.

The evening session was called to order by the Vice President, Mr. Geo. J. Kellogg.

The program was furnished by students of the Department of Horticulture of the University of Wisconsin. The program was liberally interspersed with music by the Madison Glee Club, and papers were presented by students on the following subjects: "Improvement of Fruits," Jas. Milward. (See index.) "Cranberry Growing," H. Malde. (See index.) "The Commission Man and the Fruit Grower," E. Feldkamp.

After a selection of music by the Mandolin Club the meeting was declared adjourned.

THURSDAY—MORNING SESSION.

The meeting was called to order by President Loope at 9:30 o'clock.

The President: I think the first thing in order this morning is the report of the Finance Committee if it is ready to report.

REPORT OF FINANCE COMMITTEE.

Madison, February 8th, 1905.

To the President and Members of the Wisconsin State Horticulturist Society:

The undersigned, your committee on Finance, have this day examined the books, vouchers and accounts of your Secretary and Treasurer and find the account of Treasurer corresponds to the bills filed with your Secretary.

We would respectfully recommend that the reports of your Secretary and Treasurer be accepted and adopted as read.

Respectfully submitted,
W. P. BUSSEY,
IRVING C. SMITH.

On motion of Mr. Geo. J. Kellogg the report of the Finance Committee was adopted, also the reports of the Secretary and Treasurer.

The President: I believe the committee appointed to report on the matter of judging fruit is ready to report.

REPORT OF COMMITTEE ON JUDGING FRUIT.

PROF. E. P. SANDSTEN, Chairman.

Scale of Points in Judging Fruits.

1.	Uniformity	25
2.	Freedom from Insect and Fungi Injury	20
3.	Condition of the fruit	15
4.	Form and type	10
5.	Color	10
6.	Size	10
7.	Freedom from blemishes	10

Exhibitor may be required to give an affidavit if in the judgment of the judges the fruit is not grown by him or if a protest is made.

Inferior specimens should under no conditions be awarded a premium.

Exhibitors should be allowed to correct the names of their specimens up to the time of judging, and if possible the judge or judges should be present to aid the exhibitor in this work. The judges should throw out all specimens not true to name.

Every association offering premiums should be required to furnish competent judge or judges.

Respectfully submitted,
E. P. SANDSTEN,
A. J. PHILLIPS,
R. J. COE.

Mr. A. J. Philips: I think the professor omitted one point. I think all fairs or associations should furnish competent judges, and those judges should be there at least a half day before the judging is to begin in order to help the people name the fruit.

Mr. Wm. Toole: I believe there should be one feature added, and that is regard to whether people grow their own fruit. I think that should be attended to by the Association and not brought to the attention of the judges. The judges are there to judge fruit and not to attend to such matters.

Mr. A. J. Philips: We put that clause in there especially to allow the officers to protest and then the judges can take the protest into consideration.

On motion of Mr. Geo. J. Kellogg the report of the committee was unanimously adopted.

On motion of Geo. J. Kellogg it was decided to request both state and county organizations to publish these rules and regulations in their premium books.

The President: We have with us this morning a very eminent man who will address us on the subject of cold storage of fruits.

Prof. J. C. Blair, of Illinois, then addressed the Society on the subject of "Cold Storage of Fruits." (See index.)

The President: Prof. Sandsten will now tell us something about plant breeding.

"Plant Breeding" was the subject of a paper presented by Prof. E. P. Sandsten. (See index.)

The President: Ladies and Gentlemen, it gives me great pleasure to introduce to you Senator Stout, a gentleman whom you all know, and whose reputation for humanitarian principles is not confined to the state of Wisconsin, but is as wide as the nation.

Senator Stout then briefly addressed the audience upon the subject of the proposed establishment of an experimental horticultural farm in Dunn county, Wisconsin.

On motion of Mr. A. D. Barnes the chair was authorized to appoint a committee of three to confer with Senator Stout in regard to his request made of the Society.

The President: We have another paper this morning by Prof. Denniston which I will call for at this time.

Prof. R. H. Denniston presented a paper on the subject of "Native Medicinal Plants." (See index.)

As members of a committee to confer with Senator Stout the chair appointed Messrs. A. D. Barnes, S. H. Marshall and W. J. Moyle.

On motion of Mr. Philips the meeting adjourned.

THURSDAY—AFTERNOON SESSION.

The meeting was called to order by President Loope at 2 o'clock.

The President: I think the first thing we will take up this afternoon is the report of the Committee on Awards. Mr. Kellogg is chairman of that committee.

REPORT OF COMMITTEE ON AWARDS.

L. G. KELLOGG, Chairman.

To the President and members of the Wisconsin State Horticultural Society:

Your committee appointed to make the awards on fruit exhibited at the annual meeting of the W. S. H. S. beg leave to report that we have carefully examined the same and award the following premiums.

Signed: L. G. KELLOGG,
J. J. MENN.

Best collection apples	W. H. Steele, 1st; F. W. Harland, 2nd.
Best 4 varieties winter apples	T. E. Loope, 1st; F. W. Harland, 2nd.
Best 3 varieties winter apples	W. A. Toole, 1st; T. E. Loope, 2nd.
Best new apple	Mrs. R. Ramsay, $1.50; A. D. Brown, $1.50. Second prem., F. H. Chappel $1.50.
Best Seedling Sweet	W. H. Steele, $2.50; F. W. Harland, $1.25.
Best Seedling Sour	A. J. Philips, $2.50; J. Howie, $1.25.
Best plate Bailey	F. W. Harland, 1st; W. A. Toole, 2nd.
Best plate Ben Davis	W. H. Steele, 1st; F. W. Harland, 2nd.
Best plate Fameuse	A. D. Barnes, 1st; A. N. Kelly, 2nd.
Best plate Gano	F. W. Harland, 1st; W. H. Steele, 2nd.
Best Plate Golden Russet	A. N. Kelly, 1st; Geo. J. Kellogg, 2nd.
Best plate Grimes' Golden	A. W. Saxe, 1st; T. E. Loope, 2nd.
Best plate Longfield	F. W. Harland, 1st; F. H. Chappel, 2nd.
Best plate Malinda	A. N. Kelly, 1st; A. D. Barnes, 2nd.
Best plate Newell	A. D. Brown, 1st; W. A. Toole, 2nd.
Best plate Northwestern Greening	A. N. Kelly, 1st; W. A. Toole, 2nd.
Best plate Patten Greening	F. H. Chappel, 1st; F. W. Harland, 2nd.
Best Perry Russett	W. A. Toole, 1st; W. H. Steele, 2nd.
Best Pewaukee	W. H. Steele, 1st; F. W. Harland, 2nd.

Best Scott Winter	Mrs. R. Ramsay, 1st; T. E. Loope, 2nd.
Best plate Tolman	A. D. Barnes, 1st; W. H. Steele, 2nd.
Best plate Wealthy	W. A. Toole, 1st, $2.00; T. E. Loope, 2nd, $1.00.
Best plate Windsor	F. H. Chappel, 1st; J. Howie, 2nd.
Best plate Baldwin	Geo. J. Kellogg, 1st; Geo. J. Jeffrey, 2nd.
Best plate Bellflower	W. H. Steele, 1st; F. W. Harland, 2nd.
Best plate Fallawater	F. W. Harland, 1st; Geo. J. Jeffrey, 2nd.
Best plate Mann	F. W. Harland, 1st; W. H. Steele, 2nd.
Best plate Seek-No-Further	W. H. Steele, 1st; F. W. Harland, 2nd.
Best plate Twenty Ounce	W. H. Steele, 1st; F. W. Harland, 2nd.
Best plate Willow Twig	W. B. Cole, 1st; E. G. Updike, 2nd.
Best plate Avista	A. J. Philips, 1st.
Best plate Eureka	A. J. Philips, 1st.
Best plate Dominion	A. J. Philips, 1st; W. H. Steele, 2nd.
Best plate Wolf River	W. H. Steele, 1st; A. D. Barnes, 2nd.
Best plate McIntosh	F. W. Harland, 1st; E. D. Bingham, 2nd.
Best plate McMahan	F. H. Chappel, 1st; A. D. Barnes, 2nd.
Best plate Milwaukee	W. H. Steele, 1st; Geo. J. Jeffrey, 2nd.
Best plate Utter	W. H. Steele, 1st; Geo. C. Church, 2nd.
Best plate Walbridge	A. D. Barnes, 1st; A. N. Kelley, 2nd.
Best plate Salome	F. H. Harland, 1st; Geo. J. Jeffrey, 2nd.
Best plate Blue Pearmain	F. W. Harland, 1st.
Best plate Fall Orange	W. H. Steele, 1st.
Best exhibit cranberries	S. N. Whittlesey, 2nd.

On motion of Mr. Wm. Toole the report of the committee was unanimously adopted.

The President: Now we come to the consideration of fungous diseases and their prevention, which should prove an interesting subject to us, particularly as we have some experts in that line with us from whom we are going to hear. I will first call on Prof. Brown for his paper.

Prof. W. S. Brown then read a paper giving some "Elementary Facts Concerning Fungous Diseases." (See index.)

The President: We have a committee appointed to revise the constitution and I will call upon that revision committee to report at this time.

REPORT OF COMMITTEE ON REVISION OF CONSTITUTION.

S. H. MARSHALL, Chairman.

This committee has gone over the constitution very carefully, and we submit this revised constitution in the shape of a report of the committee.

(The revised constitution as adopted appears in another part of this report.)

On motion of Mr. L. G. Kellogg the constitution as amended and reported by the committee was unanimously adopted.

Mr. Ames submitted a resolution to request the legislature to enact a law making it unlawful to camp in tent, wagon or otherwise on the highways in the state of Wisconsin.

On motion of Mr. Philips the resolution was adopted.

FRIDAY—MORNING SESSION.

The meeting was called to order by the president at 9:30 o'clock.

The President: The first number on the program this morning is a memorial service in memory of the late J. S. Stickney, and Mr. Irving Smith will deliver a memorial address.

Mr. Irving Smith then delivered a "Memorial Address upon the late J. S. Stickney." (See index.)

Others who spoke in memory of Mr. Stickney were Messrs. Loope, G. J. Kellogg, Philips, Toole and Moyle.

Adjourned.

WISCONSIN STATE HORTICULTURAL SOCIETY ANNUAL CONVENTION

Madison, February 7, 8, 9 and 10, 1905.

PRESIDENT'S ADDRESS.

The lapse of time has brought us to another mile post in the history of our Society. During the year we have had matters of considerable importance to deal with, and we hope the verdict of our actions may be favorable, for we have tried to do our best.

The Louisiana Purchase Exposition has come and gone, and is an historical event in which our friends say we have scored a success for Wisconsin, and we believe the most our critics can say is that we might have done better. We are willing to leave it to the general judgment.

To those who have never been in the management of such events, it may seem an easy task to install and keep up such an exhibit, but I assure you that it requires much tact, energy and common sense and our officers have shown their ability in a marked manner in the present instance.

It has given me much pleasure to note the enthusiastic support given by all who have had the work in hand. To me it has been especially gratifying to have been the recipient of so much helpful co-operation and so many words of cheer during this period. There has been no hanging back,—no halfheartedness, no spirit of criticism in our ranks.

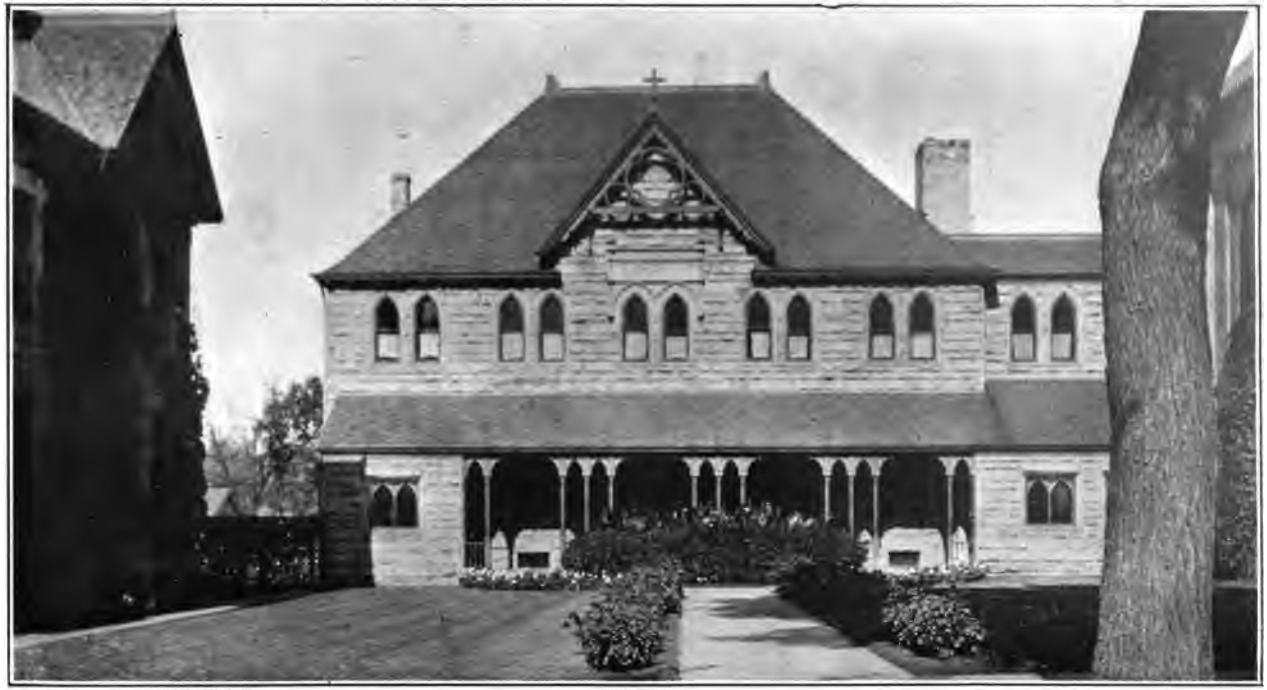
The results of this exhibit can not be summed up in dollars or medals. I think the ultimate good will be to determine that Wisconsin can grow excellent fruit in spite of our rigorous climate; in spite of the oft repeated cry that our state is not adapted to apple culture, and that when we recognize the proper varieties to plant, there is no state or locality that can successfully claim to outrank us in color, size, and general excellence of apples. I believe that in summer and fall apples Wisconsin can hold her own, if not actually outstrip, all others. Whoever has seen our exhibit at Buffalo or St. Louis will bear witness to the beauty of our McMahan, Wolf River, Northwestern Greening, and last but not least, the luscious, exquisitely colored Wealthy. All of them beauties; all of them abundantly prolific; all of them sought after in market and all bringing good money. The present season was a record breaking one for the apples just named, and the prices paid by shippers were equal to, if not better, than those paid in the eastern states for the standard winter apples. In Eureka this year an eight-year-old Wealthy tree produced sixteen and one-half bushels of apples. This impels me to say that we have in our state large commercial orchards in Winnebago, Richland, Waukesha, Marathon, Pierce, Clark, and many other counties which are capable of producing 500,000 barrels a year. The trees are not planted but the orchards and apples are there in the soil and climate. It only remains for the man to plant and care for them. When 500 men will plant 1,000 Wealthy trees and care for them intelligently for a few years the barrels of apples follow and so will a million dollars. The possibilities are with us and while it is well to strive for better fruit, it is not good sense to ignore the capabilities of what we already have.

Wisconsin can and does grow fine small fruits in generous profusion.

Wisconsin's native plums are excellent and will easily become a source of great revenue while foreign varieties are too tender, except in a few favored localities.

Wisconsin divided the honors of Apple Day at St. Louis with the great apple state of Missouri. We gave away twenty-five barrels of Wealthy apples, one by one, as the crowd passed by, and by this act heralded the fame of that northern-grown fruit over all the states. Wisconsin Wealthys was our slogan and we marched to victory. Their excellence was challenged by none. The wrapper and paster on each specimen was admittedly the neatest legend shown by any state.

GUILD HALL, MADISON, WIS., IN WINTER.
Meeting place of Society, February, 1905.



GUILD HALL, MADISON, WIS., IN SUMMER.

Each year brings our Society added duties and responsibilities. To meet them we must be earnest and energetic, zealous and true to our mission; not content with merely routine work but ever looking forward to the betterment of existing conditions. We must point out with no uncertain note the highway to Horticultural success for those who wish to travel therein, giving warning of the dangerous side tracks, the quagmire that might swallow them up, and give specific instruction necessary to conduct them in safety, and if any have fallen by the way lead them to terra firma and show them the only road to success.

In new fields I have in mind a seedling station where new fruits, especially apples, might be tested carefully and intelligently. If we fail, we fail trying; if we succeed, we may secure brilliant results. The Wealthy apple came by this route, and if we could secure a winter apple equally as good, the result would be beyond price. A small fruit station ought to be a source of much benefit; developing new, and testing known varieties might, if carefully carried on, give much valuable information. The small fruit industry is, in a commercial sense, an important matter. Many people are engaged in it, and improved varieties and methods are eagerly sought for. All the people want more and better small fruits.

The State Horticultural Experiment Station has done wonderful work on the subject of our native plums, and we could properly leave them to further develop the work already begun. Our experimental orchards have received due attention. We have planted the Poplar orchard in part this year, and I am sanguine of complete success there. An ornamental tree and shrub feature will be added by an arrangement with the officials of the Northern Pacific Railroad. This will be a park extension of the orchard and will occupy the grounds adjacent to the depot. It should from its location be an attractive object lesson. All travelers who pass can see and realize what we are striving to show.

The orchard at Eagle River was greatly injured by the extreme cold of last winter which killed many forest trees in that section. We have renewed many trees and shall carry the experiment to a finality. Our orchards at Wausau and Medford are doing well. The Secretary will give details. The Secretary's office has been no idle place the past year. Bulletins have been issued from time to time. The annual reports have been distributed in largely increased numbers. Our membership list has been considerably augmented but efforts for a still greater list of members should engage our attention. A genuine boom is our due.

Our constitution and by-laws need a careful revision to bring them up to the present condition of affairs, and a committee will be appointed for that purpose at the present session.

The attendance at our annual meetings ought to be largely in excess of what it has been in years past. If we can devise any way to increase this it should enlist our earnest consideration. I hope each member present will take upon himself the duty of making our sessions profitable and interesting, and your presiding officer will be glad to be here. Make your statements concise and to the point. Don't lug in issues foreign to the subject. Be amiable, considerate, wise, and we will all be edified and instructed. I thank you all for the many courtesies extended me during the time I have served you as presiding officer.

REPORT OF SECRETARY CRANEFIELD.

The following report on the condition and progress of the Society is submitted:

The year 1904 marks several important changes in the management of the Society.

1. By action of the Executive Committee at the meeting held Feb. 5th, 1904, the salary of Secretary was increased to an extent that it enables him to devote his entire time to the duties of the office, placing our Society on the same basis in this respect as those of other states.

2. At the same time the office of Secretary was combined with that of Superintendent of Trial Orchards, the orchard committee remaining as an advisory board.

3. A sub-committee to be known temporarily as the Emergency Committee was appointed, consisting of the President, Treasurer and Secretary, this committee to be granted all powers and privileges of the full Executive Committee.

Probably no other change has ever been made in the management of the Society as important and valuable as this one. Heretofore executive committee meetings have been of infrequent occurrence; in fact full meetings have been called but once or twice in the history of the Society except at annual meetings. As a result no business of importance bearing the stamp of authority could be conducted in the six months intervening between meetings except by the slow and unsatisfactory means of correspondence. The existence of this sub-committee, which may be called together at slight expense, permits the timely transaction of business and divides with the Secretary the responsibility of affairs. It is the experience in all organizations of the class of ours that in order to conduct the routine business expeditiously and at least expense, it must be in the hands of a small committee. The interests of the Society demand that this committee be perpetuated.

The emergency committee met seven times during the year as follows:

Milwaukee, Feb. 25th and Sept. 8th.

Madison, March 31st, May 10th, May 30th, July 27th, and Nov. 22nd. A condensed report of the proceedings of the committee at the different meetings follows:

Milwaukee meeting, Feb. 25th.—Authorizing the Secretary to purchase office furniture and supplies.

To purchase spraying outfit for Wausau orchard.

To employ office help as needed.

To have printed uniform bills, forms, etc., for use of Society.

Setting aside $1,000.00 for World's Fair fruit show.

At the adjournment of the emergency committee meeting a meeting of the orchard committee was called when varieties of fruit for Poplar orchard were selected, also general discussion of other orchards.

Madison meeting, March 31st.—By direction of committee President Loope appointed A. A. Parsons as Superintendent of World's Fair fruit exhibit.

Secretary authorized to call summer meeting of Society at Lake Geneva, latter part of June.

Madison meeting, May 30th.—A general discussion of World's Fair matters.

Madison meeting, July 27th.—A discussion of World's Fair matter. Secretary authorized to execute lease with Northern Pacific R. R. Co., for certain lands at Poplar, Wis. and plant same to shrubbery at expense of Society.

Special cash premium of $5.00 voted to Omro Society for Chrysanthemum show.

Milwaukee meeting, Sept. 8th.—An informal meeting of Committee at State Fair grounds. Mr. Kellogg absent. General discussion of World's Fair matter with special reference to Apple Day.

Madison meeting, Nov. 22nd.—The following subjects were discussed:

Time and place of annual meeting, programme, premium list, trial orchards and World's Fair matter.

Secretary was authorized to call a meeting as provided by the Constitution, Feb. 7, 10. Place of meeting, premium list and details of banquet left to Secretary and Mr. Marshall.

The Secretary authorized to purchase certain property from the Wisconsin Commission for use of Society.

The President announced the following appointments:

Delegate to Ill. State Meeting, Profesor Sandsten.

Delegate to Iowa State Meeting, W. J. Moyle.

Delegate to N. E. Meeting, A. J. Phillips.

Delegate to Minn. State Meeting, F. Cranefield.

Secretary authorized to issue Bulletins 3 and 4.

Executive Committee meetings.—Two meetings of the full executive committee were held during the year; at Madison Feb. 5th and at Lake Geneva June 29th. The proceedings of each meeting follows:

Meeting of Executive Committee, room 410, State Capitol, Feb. 5th, 1904; President Loope in chair. The following members present:

Vice-President George J. Kellogg, Treasurer L. G. Kellogg, S. H. Marshall, C. L. Richardson, W. A. Toole, Irving Smith, President T. E. Loope, W. P. Bussey, J. J. Menn, Wm. Toole, W. J. Moyle, Secretary F. Cranefield.

The following motions prevailed:

1. Authorizing the Secretary to purchase 65 dozen plates for St. Louis exhibit.

2. The salary of Secretary to be $100.00 per month for coming year beginning March 1st and compensations for month of Feb., 1904 to be adjusted by Committee at next meeting. The Secretary to act as Superintendent of all Trial Orchards.

3. An emergency committee consisting of President, Treasurer, and Secretary shall be empowered to act for the full committee.

4. The President to be allowed $50.00 for expense account for the year 1903.

5. Resolution concerning nursery inspection and control referred to a committee consisting of L. G. Kellogg, F. C. Edwards, and the Secretary. Meeting adjourned.

Minutes of meeting of Executive Committee held at Opera House, Lake Geneva, Wis., June 29th, 1904. Present the following:

President, T. E. Loope, Vice-President, George J. Kellogg, Secretary F. Cranefield, W. P. Bussey, S. H. Marshall, W. J. Moyle, Wm. Toole, J. J. Menn.

The following motions prevailed:

1. Allowing the Secretary full pay for February.

2. Directing Secretary to provide certain signs for St. Louis exhibit.

3. Providing for a relay of members of the Society to serve two weeks each as assistants at St. Louis Exhibit, expenses to be paid by Society. The appointments to be made by the President.

4. Authorizing Secretary to send reports and bulletins to persons other than members, the Society to pay postage, express or freight charges.

5. That Society defray expense of steamer for excursion the following day. Meeting adjourned.

Summer meetings.—The summer meeting was held at Lake Geneva, June 29th and 30th. The attendance was not large, probably owing to the fact that the meeting occurred during the height of the berry season. The program on the first day was enjoyed by all present. The display of fruit and flowers was excellent. For the first time, professionals and amateurs were placed in separate classes and cash premiums offered in the former and diplomas in the latter class. The result was wholly satisfactory. A heavy rainstorm on the second day cut short the excursion around the lake, but in the inspection of the rose gardens of Mr. Mitchell and the orchid houses of Mr. Selfridge the excursionists were well pleased.

BULLETINS.

As stated above the Executive Committee at its February meeting authorized the publication of bulletins. Under this authority three bulletins have been issued as follows:

Bulletin No. 1, March, 1904.—The Planting of Trees and Shrubs, 1,500 copies, p. p. 14. Illustrations, 3. Total cost, $41.13.

Bulletin No. 2, April, 1904.—Strawberries for the Home Garden, 2,000 copies, p. p. 14. Illustrations, 12. Total cost, $32.25.

Bulletin No. 3, October, 1904.—Spring Flowering Bulbs, 1,000 copies, p. p. 7. Total cost, $12.75.

Special Bulletin.—Trial Orchards of Wisconsin. For distribution at World's Fair, county and state fairs, 3,000 copies, p. p. 4. Total cost, $12.50.

These bulletins have been well received by the members and when advertised for free distribution have proven popular and a means of increasing our membership. It is a feature that can well be extended. A friendly criticism has been offered that the bulletins appear under the signature of the Secretary rather than in blank. This is merely following the custom of writers in general and scarcely needs justification. The Secretary was the author in every case and the author's name appears in connection with any reputable publication. Anonymous publications have but little standing. The success of the bulletins would seem to justify the continuance of their publication.

Press Bulletins.—In addition to the bulletins mentioned several press bulletins have been issued. Some of the members here today may have read in their local paper, a little "patent insides" printed in the neighboring village, something relating to the Society. When it is realized that there are over 600 of these papers in the state and that their readers are almost wholly the farmers and fruit growers of the state, it will be seen what a powerful aid they may become in advertising our work and in disseminating information. The following press bulletins have been sent out:

No. 1. History of Wisconsin State Horticultural Society, 600 copies, cost, $17.60.

No. 2. Fruit Report, 430 copies, cost $10.87.

No. 3. Announcement of summer meeting, 425 copies, cost, $6.39.

No. 4. Posters, mailed to members only, 500 copies, cost, $6.86.

No. 5. Wisconsin Fruit at St. Louis, 402 copies, cost, $6.69.

No. 6. Fruit for Winter meeting, 402 copies, cost, $7.93.

No. 7. The Trial Orchards, reprint of special bulletin, 425 copies, cost, $6.77.

No. 8. World's Fair Awards, 402 copies, cost, $7.07.

The total number of pieces of mail delivered at the Madison office from the office of the State Horticultural Society amounts to over 15,000.

ANNUAL REPORT.

The annual report since 1882 has appeared promptly, one year behind time at the annual winter meeting with the exception of the 1903 report which was discovered untouched in the printer's hands Feb. 10th, 1903. After much labor with the state printer the 1903 report was finally set in type, and at the same time the 1904 report was submitted to the governor for approval. After many annoying delays occasioned indirectly by the capitol fire, which necessitated much state printing, the two reports, viz., 1903 and 1904, were delivered to the Secretary on the same day, viz., May 25th, and soon after distributed. The 1904 report contained the proceedings of but one meeting, viz., the winter meeting, 1904, and to fill the number of pages allowed by law Bulletins No. 1 and No. 2 and Experiment Station Bulletin No. 105 were reprinted. By following this plan future reports may be issued within a few weeks following the winter meeting and contain full proceedings for one year.

DISTRIBUTION OF REPORTS.

The statutes provide that 7,000 copies of our report shall be printed. The distribution of 3,500 of these is provided for in the same law, leaving 3,500 copies to be distributed by the Society. Our membership and exchange list calls for about 350 copies leaving over 3,000 copies on hand. No question has so perplexed me during the year as this one of distribution of the reports. The books should be in the hands of the people, not stored in the capitol. After sending the copies to members and exchanges the following 1904 reports were sent out.

To local societies	549	copies
To World's Fair	250	"
Professor R. A. Moore, for students,...	300	"
County Agricultural Schools	170	"
Total	1,269	"

Occasional applications will swell this to a total of 1,300 copies distributed up to Oct. 1st. At this time a circular letter was mailed to 61 of the county clerks of the state requesting the privilege of sending each a box of reports, freight prepaid, for distribution at fall meetings of the county board. Fifty-one clerks responded and to these were sent 1,628 copies of the 1904 and 979 copies of the 1903 report. Ten counties, viz.: Clark, Fond du Lac, Kewaunee, Lincoln, Marinette, Oconto, Pepin, Racine, Sawyer and Trempealeau evidently did not consider the reports worth the trouble of returning an addressed postal card.

OFFICE ROOMS.

The question of office room for the Society was settled soon after the last annual meeting when General Bryant granted the use of a large room in the south wing of the capitol building. Preparations were completed for occupying these rooms when the disastrous fire of Feb. 29th destroyed the entire upper floors of the capitol. After consulting with President Loope, offices were rented for one year from March 1st at 24 E. Mifflin St. While nothing definite can be stated at the present time it is probable that temporary quarters may be had in the capitol after adjournment of the legislature.

WORLD'S FAIR.

The collecting of fruit for the Wisconsin exhibit at St. Louis occupied at least one-half of my time from May to December and more time could have been given to advantage. The report of this work will be presented separately.

TRIAL ORCHARDS.

The work connected with the trial orchards also occupied much time and necessitated many trips to Northern Wisconsin. The detailed report of this work will be presented separately.

FAIRS.

An exhibit of fruit from the Wausau orchard was made at the Marathon county fair. This exhibit comprising 53 plates, and 26 varieties of apples and plums was set up and left in charge of Prof. R. B. Johns of the Marathon County School of Agriculture as the State Fair occurred the same week. The thanks of the Society are due Professor Johns for his services here, and throughout the season I have found him ever ready and willing to give his time to our Society with no thought of pay for his services.

An exhibit similar to that at Wausau was set up at Milwaukee. The Wausau exhibit attracted much attention and very many Marathon county people learned for the first time of the existence of the State Horticultural Society and the fact that a trial orchard was located in their own county. The State Fair exhibit unfortunately arrived too late to be assigned a place on the tables and was crowded in between two large exhibits and in a measure lost.

LOCAL SOCIETIES.

One of the main factors of strength in a state society is the active co-operation with numerous and flourishing local or auxiliary societies. The year was begun with brave promises to aid in increasing the number of these societies as well as to be helpful in some manner in increasing the membership of those now existing, but the multitude of duties occasioned by the St. Louis Fair, etc., has left but little time for this work. The following societies are known to be in existence: Omro, Waupaca, Lake Mills, Madison, Algoma, Sauk county, and Rushford. Eau Claire Fruit Growers Association, 125 members. An interesting history of the Madison Society will be presented by the delegate today. The Eau Clairs Society was accidentally discovered through means of a newspaper article. Although founded for the purpose of protecting the interests of its members in shipping small fruits, it must be ranked as the leading local horticultural society in the state in pursuit of membership and activity. A letter received from Mr. Roblee of Appleton in October last announced the disbanding of the Grand Chute Society, the oldest local society in the state. The records were forwarded to me by Mr. Roblee and have been placed on file.

LIBRARY.

The library consisting of about 300 copies of reports of the societies of neighboring states and an incomplete file of our own reports and the Wisconsin Horticulturist was totally destroyed in the capitol fire of February 29th. A complete file of our reports was contributed by Mr. Smith, librarian of the university. The task of replacing the burned library was undertaken by our efficient Corresponding Secretary, Mr. W. A.

Toole, who has succeeded in building up a better library by far than the one lost in the fire.

The detailed record will appear in Mr. Toole's report. The call for old reports received liberal responses from the members, but numbers of the Wisconsin Horticulturist were much slower in coming in. A few scattering numbers were received; later an incomplete set was purchased for $5.00, and six numbers are still lacking.

MEMBERSHIP.

The membership of the Society has increased the past year from 110 to 217, a gain of 107, or over 97%.

GIFTS.

The following gifts have been received during the year: A. D. Barnes, Waupaca, Wis., 9 vols. reports; Irving Smith, Green Bay, 23 vols. reports; Wm. Toole, Baraboo, 22 vols. reports, 66 numbers Wisconsin Horticulturist; C. A. Abbott, Appleton, 26 vols. reports; J. J. Menn, Norwalk, 10 vols. reports; Jonathan Periam, Chicago, 12 vols. Proceedings American Pomological Society; Michigan Horticultural Society, 31 vols. reports; Iowa Horticultural Society, 25 vols. reports; Western New York Society, 8 vols. reports; Indiana Horticultural Society, 22 vols. reports; Missouri Horticultural Society, 41 vols. reports; Massachusetts Horticultural Society, 98 vols. reports; C. G. Patten, 4 seedling plum trees; Stark Nursery Co., 14 plum trees; Merrimac Chemical Co., Boston, Mass., 50 lbs. arsenate of lead; W. D. Williamson, Madison, 26 tree protectors.

FINANCE REPORT OF SECRETARY.

RECEIPTS.

Order No. 58	$100 00
Order No. 59	150 00
Order No. 60	100 00
Order No. 71	100 00
Order No. 75	50 00

Order No. 77	100 00	
Order No. 86	100 00	
Order No. 99	100 00	
Order No. 104	100 00	
Order No. 105	100 00	
Order No. 137	10 00	
Order No. 144	100 00	
Order No. 145	100 00	
Order No. 153	100 00	
Order No. 159	25 00	
Order No. 181	100 00	
Order No. 189	100 00	
Order No. 212	100 00	
Order No. 224	100 00	
Order No. 237	100 00	
Order No. 239	50 00	
		$1,885 00
Membership fees, World's Fair vouchers, refund on mileage books		215 13
Total cash receipts		$2,100 13

EXPENDITURE.

Expense account	$677 87
July 27th, paid L. G. Kellogg, treasurer	74 53
Credit by salary	1,200 00
Feb. 6th, paid L. G. Kellogg for memberships	140 60
Feb. 7th, paid L. G. Kellogg to balance	7 13
Total	$2,100 13

EXPENSE ACCOUNT ITEMIZED.

Postage	$79 74
Express, freight and dray	90 51
Telegraph and telephone	15 29
Expenses summer meeting	42 25
Traveling expenses	293 02
Office fixtures and stationery	26 66
Cash to A. A. Parsons	65 00
Office help	25 10
Books for library	9 15
Miscellaneous	31 15
Total	$677 87

REPORT OF TREASURER.

L. G. Kellogg, Treasurer, in account with the Wisconsin State Horticultural Society:

RECEIPTS.

1904.		Dr.
Feb. 4.	To balance due the Society	$301 75
Feb. 4.	To cash for membership	54 50
Feb. 26.	To cash from state treasurer	2,000 00
Apr. 27.	To cash from state treasurer	1,625 00
July 26.	To refund World's Fair voucher No. 509	31 53
July 26.	To refund on mileage book	19 50
Aug. 19.	To cash from state treasurer	2,000 00
Feb. 6.	To cash, F. Cranefield, memberships	55 50
Feb. 6.	To cash refund on mileage books	39 00
Feb. 6.	To cash refund on World's Fair voucher No. 608	46 10
Feb. 6.	To cash returned from F. Cranefield	7 13
	Total	$6,180 01

DISBURSEMENTS.

1904.	No.		Cr.
Feb. 4.	1.	By F. Cranefield, mounting chart	35
Feb. 4.	2.	By L H. Palmer, expense acc. winter meeting	1 51
Feb. 4.	3.	By C. Philipson, expense acc. winter meeting	4 09
Feb. 4.	4.	By W. M. Roblee, expense acc. winter meeting	4 77
Feb. 4.	5.	By D. E. Bingham, expense acc. winter meeting	10 47
Feb. 4.	6.	C. L. Pearson, expense acc. winter meeting	1 51
Feb. 4.	7.	By W. S. Hager, expense acc. winter meeting	6 70
Feb. 4.	8.	By P. A. Ham, expense acc. winter meeting	13 06
Feb. 4.	10.	By T. E. Loope, traveling expense meeting	6 00
Feb. 4.	10.	By T. E. Loope, eraveling expense account	30 85
Feb. 4.	11.	By G. Landweer, delegate to winter meeting	18 50
Feb. 4.	12.	To A. D. Barnes, delegate to winter meeting	13 06
Feb. 4.	13.	To A. N. Kelly, premiums at winter meeting	6 50
Feb. 4.	14.	By T. E. Loope, premiums	44 50
Feb. 4.	15.	By W. A. Toole, premiums	2 00
Feb. 4.	16.	By Mrs. C. Alexander, premiums	1 50
Feb. 4.	17.	By Geo. J. Kellogg, premiums	50
Feb. 4.	18.	By L. G. Kellogg, premiums	3 00
Feb. 4.	19.	By L. Grieling, premiums	5$

Feb. 4.	20.	By Geo. J. Jeffrey, premiums	22 00
Feb. 4.	21.	By A. D. Barnes, premiums	33 00
Feb. 4.	22.	By A. A. Parsons, traveling exp. acc.	4 25
Feb. 4.	23.	By W. J. Jenkins, traveling exp. acc.	4 00
Feb. 4.	24.	By W. P. Bussey, traveling exp. acc.	4 00
Feb. 4.	25.	By Irving C. Smith, traveling exp.	6 10
Feb. 4.	26.	By F. J. Diley, delegate to winter meeting	3 82
Feb. 4.	27.	By Geo. J. Jeffrey, member of executive committee	3 40
Feb. 4.	28.	By Grace Troutner, exp. attending winter meeting	31 87
Feb. 4.	29.	By A. J. Philips, expense attending winter meeting	7 22
Feb. 4.	30.	By C. A. Abbott, member of executive committee	5 12
Feb. 4.	31.	By Ella Menn, exp. attending winter meeting	3 80
Feb. 4.	32.	By J. J. Menn, exp. attending winter meeting	3 80
Feb. 4.	33.	By Wm. Toole, exp. attending winter meeting	1 50
Feb. 4.	34.	By Mrs. D. Huntley, exp. attending winter meeting	1 58
Feb. 4.	35.	By Geo. J. Kellogg, exp. attending winter meeting	1 38
Feb. 4.	36.	By B. S. Hillier, exp. attending winter meeting	1 33
Feb. 4.	37.	By Franklin Johnson, exp. attending winter meeting	1 48
Feb. 4.	38.	By W. J. Moyle, exp. attending winter meeting	5 00
Feb. 8.	39.	By H. Huppler, hotel accommodations	205 35
Feb. 24.	40.	By H. B. McGowan, use of plates and vases	6 55
Feb. 20.	41.	By W. D. Frost, service and use of lantern	5 00
Feb. 24.	42.	By F. C. Edwards, expense acc. winter meeting	1 30
Feb. 24.	43.	By C. L. Richardson, expense acc. winter meeting	7 26
Feb. 24.	44.	By Am. Florist Co.	2 00
Mar. 8.	45.	By Jas. E. Morley, office supplies	15 57
Mar. 8.	46.	By Est. Timothy Brown, office rent	15 00
Mar. 8.	47.	By A. H. Haswell & Co., table	1 75
Mar. 11.	48.	By Emma Jacobson, reporting winter meeting	66 44
Mar. 11.	49.	By A. H. Haswell Co., table	1 75
Mar. 12.	50.	By Jennie Pitman, four drawings	2 50
Mar. 12.	51.	By Whitehead Hoag Co., badges	15 15
Mar. 16.	52.	By A. D. & A. V. Frederickson, book shelves for office	30 00
Mar. 16.	53.	By C. H. Marshall, traveling exp. acc.	13 97
Mar. 23.	54.	To T. E. Loope, incidental exp. acc.	25 00
Mar. 26.	55.	Geo. B. Hudnall, recording Poplar lease	4 00
Mar. 28.	56.	By Miss M. L. Snyder, typewriting	5 75
Mar. 31.	57.	By Cantwell Prtg. Co., printing	52 63
Mar. 31.	58.	By F. Cranefield, salary, March	100 00
Mar. 31.	59.	By F. Cranefield, office expenses	150 00

Mar. 31.	60.	By F. Cranefield, traveling exp.	100 00
Apr. 1.	61.	By Est. Timothy Brown, office rent, April	15 00
Apr. 7.	62.	By Morrill & Morley, spray outfit	35 57
Apr. 7.	63.	J. E. Moseley, one mimeograph	24 00
Apr. 13.	64.	By Pardee Drug Co., copper sulphate	10 40
		sulphate	10 40
Apr. 14.	65.	By Wm. Trelease, expense winter meeting	8 00
Apr. 16.	66.	By Bowker Insecticide Co.	10 00
Apr. 16.	67.	By Democrat Prtg. Co., paper	1 65
Apr. 25.	68.	By T. E. Loope, traveling expenses	16 50
Apr. 27	69.	By Stephen & Studeman	1 25
May 2.	70.	By Est. Timothy Brown, office rent, May	15 00
May 2.	71.	By Fred Cranefield, salary, May	100 00
May 2.	72.	By H. B. Dodd, express	1 85
May 4.	73.	By Williams & Sons, labels	6 30
May 5.	74.	By C. M. Dengler, signs	3 00
May 6.	75.	By F. Cranefield, exp. acc. World's Fair	50 00
May 6.	76.	By Cantwell Prtg. Co., printing	42 75
May 14.	77.	By F. Cranefield, exp. acc.	100 00
May 23.	78.	By W. D. Williamson, tree protectors	10 00
May 24.	79.	By J. C. Prien, 2,000 mile ticket	60 00
May 24.	80.	By P. A. Peterson, labor, Poplar orchard	31 98
May 27.	81.	By Miss Olga Olson, stenographic service	2 00
May 27.	82.	By G. Landweer, express and services rendered	8 00
May 31.	83.	By A. A. Parsons, traveling expenses	8 26
May 31.	84.	By T. E. Loope, traveling expenses	6 00
May 31.	85.	By P. A. Peterson, labor on trial orchard	13 83
May 31.	86.	By F. Cranefield, salary, May	100 00
June 1.	87.	By Est. Timothy Brown, office rent, June	15 00
June 1.	88.	By Western Union Telegraph service	3 78
June 4.	89.	By W. J. Parks & Co., making sign	1 50
June 7.	90.	By A. D. Barnes, nursery stock	28 75
June 7.	91.	By A. P. Wilkins, nursery stock	23 55
June 7.	92.	By Coe Converse Edwards Co., nursery stock	163 75
June 9.	93.	By Ed Gensman, Wausau orchard rent	50 00
June 9.	94.	By Ed Gensman, labor and team work	55 00
June 10.	95.	By Pardee Drug Co., 100 lbs. copper sulphate	8 50
June 11.	96.	By Jewell Nursery Co., nursery stock	10 00
June 15.	97.	By C. Ovenden, office help and photos	4 27
June 15.	98.	By W. J. Moyle, nursery stock, Medford	44 70
June 17.	99.	By Fred Cranefield, expense acc.	100 00
June 24.	100.	By H. B. Dodd, express bills	2 75
June 25.	101.	By P. A. Peterson, labor, Poplar orchard	30 03
June 27.	102.	By C. Ovenden, office help	4 43
July 2.	103.	By H. B. Dodd, express bills	5 62

July 2.	104.	By F. Cranefield, salary, February..	100 00
July 2.	105.	By F. Cranefield, salary, June......	100 00
July 5.	106.	By Ed Gensman, labor, Wausau orchard	42 20
July 5.	107.	By W. P. Bussey, member executive committee	12 37
July 5.	108.	By W. J. Moyle, expense acc. summer meet	10 50
July 5.	109.	By Geo. J. Kellogg, expense acc. summer meet	12 54
July 5.	110.	By Portman & Edwards, tree protectors and freight	31 57
July 8.	111.	By J. J. Menn, member of executive committee	13 88
July 8.	112.	By S. H. Marshall, exp. acc. summer meet	16 79
July 8.	113.	By T. E. Loope, summer meet......	14 10
July 8.	114.	By Eva Loope, program summer meet	14 10
July 8.	115.	By Miss A. F. Dean, program summer meet	8 50
July 8.	116.	By E. P. Sandsten, program summer meet	5 35
July 8.	117.	By Wm. Toole, premiums summer meet	2 00
July 8.	118.	By Mrs. D. D. Howlett, premiums summer meet	5 00
July 8.	119.	By Mrs. M. Howlett, premiums summer meet	3 00
July 8.	120.	By Mrs. J. J. Ihrig, premiums summer meet	2 00
July 8.	121.	By H. C. Christenson, premiums summer meet	1 00
July 8.	122.	By W. A. Toole, premiums summer meet	3 00
July 8.	123.	By J. F. Ray, premiums summer meet	5 00
July 8.	124.	By George J. Kellogg, premiums summer meet	20 50
July 8.	125.	By Est. Timothy Brown, office rent July	15 00
July 8.	126.	By E. W. Keyes, P. M., postage.....	94 74
July 8.	127.	By Mrs. D. D. Howlett, program summer meet	12 75
July 8.	128.	By T. Ovenden, program summer meet	6 40
July 8.	129.	By K. C. Smith, program summer meet	11 59
July 8.	130.	By Wm. Toole, Executive Com.	10 38
July 8.	131.	By W. A. Toole, exp. acc. corresponding sec'y.	2 35
July 8.	132.	By W. A. Toole, summer meeting ..	10 38
July 9.	133.	By Cantwell Prtg. Co., prtg. & stationery	33 85
July 11.	134.	By Mrs. J. J. Ihrig, exp. acc. summer meet	13 54
July 11.	135.	By Parsons Prtg. Co., rubber stamp	1 55
July 11.	136.	By W. A. Toole, exp acc.	2 42
July 12.	137.	By F. Cranefield, contingent fund for A. A. Parsons	10 00
July 12.	138.	By J. C. Prien, 2000 mile book	60 00

July 12.	139	By Geo. J. Kellogg, premiums summer meet	2 00
July 19.	140.	By H. B. Dodd, express charges	6 65
July 19.	141.	By H. C. Christenson, exp. acc. summer meet	12 03
July 26.	142.	By T. E. Loope, traveling expenses	10 40
July 27.	143.	By M. L. Snyder, stenographic work	8 35
Aug. 1.	144.	By F. Cranefield, salary July	100 00
Aug. 1.	145	By F. Cranefield, traveling expenses	100 00
Aug. 1.	146.	By H. B. Dodd, express charges	2 61
Aug. 6.	147.	By Miss E. Jacobson, reporting summer meet	27 92
Aug. 1.	148.	By Estate Timothy Brown	15 00
Aug. 12.	149.	By P. A. Petersn, labor & seed, Poplar orchard	28 19
Aug. 20	150.	By C. J. Kruse, sign Wisconsin	5 75
Aug. 22.	151.	By Mrs. R. T. Darrow, special premium	5 00
Aug. 22.	152.	By Capital City Paper Co., paper	25 78
Sept. 1.	153.	By F. Cranefield, salary August	100 00
Sept. 1.	154.	By Estate Timothy Brown, rent Sept.	15 00
Sept. 1.	155.	By H. B. Dodd, express charges	8 99
Sept. 7.	156.	By C. J. Kruse, signs	10 00
Sept. 5.	157.	By Ed. Gensman, labor, Wausau Orchard	26 89
Sept. 5.	158.	By Prof. R. B. Johns, helper Wausau Fair	5 00
Sept. 9.	159.	By A. J. W. Pierce & Co., fruit world's fair	198 63
Sept. 9.	160.	By F. Cranefield, exp. acc.	25 00
Sept. 19.	161.	By Sayle Bldg. & Mfg. Co., sign for poplar orchard	5 00
Sept. 19.	162.	By Wm. Toole, supt. world's fair	41 95
Sept. 19.	163.	By P. A. Peterson, rent poplar orchard	75 00
Sept. 28.	164.	By J. J. Menn, ass't. supt. world's fair	36 65
Sept. 30.	165.	By Estate Timothy Brown, rent Oct.	15 00
Oct. 1.	166.	By John Reis, State fair special premium	7 50
Oct. 1.	167.	By A. D. Barnes State fair special premium	6 50
Oct. 1.	168.	By F. W. Chapel State Fair special premium	5 00
Oct. 1.	169.	By F. W. Harland, State Fair special	5 00
Oct. 1.	170.	By W. F. Steele, State Fair special premium	4 00
Oct. 1.	171.	By Mrs. Robt. Ramsay, State Fair special premium	4 00
Oct. 1.	172.	By W. J. Philips, State Fair special premium	4 00
Oct. 1.	173.	By E. W. Palmer, State Fair special premium	4 00
Oct. 1.	174.	By A. J. Philips, State Fair special premium	3 00
Oct. 1.	175.	By Wm. Fox, State Fair special premium	3 00

Oct. 1.	176.	By Geo. J. Jeffrey, State Fair special premium	2 00
Oct. 1.	177.	By Kelly Bros. State Fair special premium	2 00
Oct. 1.	178.	By W. S. Hager, ass't. supt. World's Fair	33 80
Oct. 1.	179.	By Cantwell Prtg. Co., printing	39 60
Oct. 1.	180.	By M. L. Snyder, stenographic work	3 75
Oct. 1.	181.	By Fred Cranefield, salary, Sept.	100 00
Oct. 6.	182.	By T. E. Loope, 25 bbls. apples, World's Fair	109 08
Oct. 7.	183.	By L. G. Kellogg, nursery stock, exp. acc.	125 54
Oct. 7.	184.	By Wm. J. Parks Co., merchandise	4 00
Oct. 10.	185.	By J. C. Prien, mileage book	60 00
Oct. 15.	186.	By E. W. Keyes, postage	17 60
Oct. 31.	187.	By E. W. Keyes, postage	5 00
Oct. 31.	188.	By P. A. Peterson, labor, Poplar orchard	20 30
Nov. 1.	189.	By Fred Cranefield, salary, Oct.	100 00
Nov. 1.	190.	By Estate Timothy Brown, office rent	15 00
Nov. 3.	191.	By Geo. J. Kellogg, supt. World's Fair	25 30
Nov. 4.	192.	By E. W. Keyes, postage	3 00
Nov. 4.	193.	By the Menges' Pharmacy Co., photo supplies	8 25
Nov. 7.	194.	By D. E. Riordan, labor, Eagle River orchard	197 50
Nov. 7.	195.	By W. H. Steele, World's Fair fruit	161 36
Nov. 7.	196.	By Geo. J. Kellogg, World's Fair fruit	7 50
Nov. 9.	197.	By J. J. Menn, World's Fair fruit	9 25
Nov. 10.	198.	By C. J. Kruse, sign painting	6 75
Nov. 11.	199.	By Sayle Mf'g. Co., crating sign	1 56
Nov. 11.	200.	By D. E. Bingham, World's Fair fruit	15 63
Nov. 18.	201.	By W. H. Steele, World's Fair fruit	23 78
	202.	Void.	
Nov. 18.	203.	By A. A. Parsons, salary, Oct.	125 00
Nov. 18.	204.	By A. A. Parsons, World's Fair exp. acc. Oct.	48 87
Nov. 18.	205.	By Mrs. F. Johnson, 7 Vols. Wis. Horticulturist,	5 00
Nov. 19.	206.	By C. L. Pearson, World's Fair fruit	2 25
Nov. 22.	207.	By A. D. Barnes, World's Fair fruit	22 07
Nov. 23.	208.	By F. T. Reeves, express charges, World's Fair fruit	1 95
Nov. 29.	209.	By T. E. Loope, exp. acc., Trial orchard com.	10 00
Nov. 29.	210.	By T. E. Loope, exp. acc. executive com.	9 00
Dec. 1.	211.	Void.	
Dec. 1.	212.	By F. Cranefield, salary, Nov.	100 00
Dec. 1.	213.	By Estate Timothy Brown, rent Dec.	15 00
Dec. 1.	214.	By H. B. Dodd, express charges	7 01
Dec. 1.	215.	By U. S. Ex. Co., express charges	3 15
Dec. 8.	216.	By E. W. Keyes, postage	5 60
Dec. 13.	217.	By W. A. Toole, expense acc. corresponding sec'y	2 00

Dec. 19.	218.	By E. E. McCloud, joint Pass.-Assn Agent		11 00
Dec. 19.	219.	By C. L. Richardson, delegate Bloomington, Ill.,		12 81
Dec. 21.	220.	By Miss M. L. Snyder stenographic work		4 00
Dec. 26.	221.	By W. J. Moyle, delegate Iowa state Soc.		23 78
1905.				
Jan.	222.	By C. A. Hatch, express, World's Fair		7 80 7 80
Jan. 3.	223.	By W. G. Pitman, cotton wadding, etc.		3 25
Jan. 3.	224.	By F. Cranefield, salary, Dec.		100 00
Jan. 4.	225.	By E. W. Keyes, postage		5 60
Jan. 5.	226.	By E. W. Keyes, postage		11 20
Jan. 4.	227.	By Estate Timothy Brown, office rent, Jan.		15 00
Jan. 11.	228.	By T. E. Loope, Del. Ills. state meet		21 80
Jan. 11.	229.	By A. J. Philips, Del. Iowa & Minn.		42 00
Jan. 14.	230.	By A. D. & J. F. Frederickson, book cases		19 46
Jan. 14.	231.	Mound City Cold Storage Co., World's Fair fruit		59 71
Jan.	232.	Sec. N. Y. Hort. Society		2 00
Jan.	233.	W. J. Moyle, traveling expense		7 78
Jan. 25.	234.	J. E. Mosley, office supplies		9 20
Jan. 26.	235.	By Cantwell Prtg. Co., printing		66 40
Jan. 28.	236.	By S. F. Harris, traveling expenses		10 00
Feb. 1.	237.	F. Cranefield, salary, Jan.		100 00
Feb. 1.	238.	By L. G. Kellogg, exp. acc.		24 19
Feb. 1.	239.	By F. Cranefield, exp. acc.		50 00
Feb. 6.	240.	By F. W. Harland, express & fruit		84 07
				6,186 60
		By Vouchers Returned		6,084 95
		By Vouchers drawn & not returned		101 65
				6,186 60
		To cash rec'd from all sources	6,180 01	
		To balance due treasurer	6 59	
			6,186 60	

REPORT OF CORRESPONDING SECRETARY, W. A. TOOLE.

As most of the members already know the library of the Wisconsin Horticultural Society was destroyed in the capitol fire last winter. Before the fire a start was made towards cataloging the library and some letters were written for the purpose of securing missing numbers of reports. The destruction of the library of course changed plans entirely and the work of building up a new library was at once commenced. The first work taken up was to secure a file of the publications of the Society. The members of the Society were very generous in contributing their reports and a complete set of the reports from 1871 to the present time were soon received. It was much more difficult however to procure a set of the magazines. All but the six numbers referred to on the back of the program were finally secured.

As soon as the work of securing a set of our own publications was well under way, letters were written to kindred societies explaining our misfortune and asking for such reports of their own proceedings as might be spared. All responded very liberally, sending whatever reports were available. In this way there were received 12 vols. of the reports of the Society of American Florists, 14 reports of the Illinois Horticultural Society, 2 reports from the Indiana Horticultural Society, 25 vols. from the Iowa Horticultural Society, a set of the transactions of the Massachusetts Horticultural Society from 1865 to date, 27 reports of the Michigan Horticultural Society, a complete set of the reports of the Minnesota Horticultural Society with the exception of vol. 7, a complete set of the reports of the Missouri Botanical Garden, 19 reports of the Missouri Horticultural Society, 4 reports of the Nebraska Horticultural Society, 10 reports of the Western New York Horticultural Society. About 30 volumes of odd reports and books on horticulture were received from members of the Society or purchased.

Jonathan Periam of Chicago gave to the Society 13 reports of the American Pomological Society. The Hon. J. W. Babcock has also had sent us nearly a complete set of Farmer's Bulletins, 7 vols. of the Yearbook of the Department of Agriculture, 36 bulletins and 42 circulars of the Division of Entomology, 51 bulletins of the Bureau of Plant Industry, 35 bulletins and 12 circulars of the Bureau of Forestry, 2 bulletins and 10 circulars of the Division of Biological Survey.

The following reports are most desired at present to complete sets: Vols. 1, 2, 3, 4, 8 and 12 of the Society of American Florists; vols. 1 and 3 to 13 inclusive, 17, 23 and 27 of the Pomological Society; vols. 1 to 22 inclusive and vols. 25 and 31 of the Illinois Horticultural Society; vols. 1 to 7 inclusive and vols. 9, 10, 12, 13, 16 and 26 of the Iowa Horticultural Society.

Previous to 1871 there were several reports of the proceedings of the Wisconsin Horticultural Society published in pamphlet form, any of these are very much desired.

These reports contain a vast amount of valuable horticultural information. Although all of them treat of a wide range of subjects, some go more fully into some special line than others. The Illinois reports are very valuable for the information on spraying, especially for fruit diseases, which they contain. The Michigan reports contain a great deal on the growing of small fruits, marketing of fruit, and spraying. In the Iowa reports varieties are discussed and much of interest is told regarding plum culture. Missouri seems to be the only state favoring dust spraying and all that may be said in favor of this method can be found in the Missouri reports, also many articles relating to commercial orcharding and strawberry growing.

The Massachusetts Horticultural Society treats most fully of Ornamental Horticulture. Minnesota, like ourselves, is still looking for new varieties. Their conditions are so much like ours in many ways that we should learn much from their reports.

This information is so buried in the mass of reports that an index is needed to make it available for reference. Some kind of card system would of course be best, this would require so much labor that a complete index of the library could not be made at once, but an index of the publications of the Wisconsin Society is much needed as it would be invaluable to our Secretary for reference and would be much used from time to time by members of the Society.

If the index were published in such form that they might be cut out and pasted upon cards they would be valuable for exchange with other Societies keeping a file of our reports and would be appreciated by our own members who have a card index for their libraries.

REPORT OF SUPERINTENDENT OF TRIAL ORCHARDS.

F. CRANEFIELD.

The following report on the trial orchards of the Society is hereby submitted:

WAUSAU.

The Wausau orchard contains at present 878 trees. As near as could be determined, but four trees were winter-killed during the season of 1903-04, these all Morello cherry.

Nearly 100 trees have perished from blight during the past two years; among these every Windsor in the orchard and several,—about 20,—of the N. Western Greening. The Windsor and many others appear to have been affected in the usual way, viz., by twig blight which has extended gradually to the larger branches, finally killing the tree. These trees were found dead on my first visit, April 14th. The N. W. Greenings perished in an entirely different manner. During the period of early spring growth the leaves on one or more large branches turned yellow and dropped, the remaining branches growing in a normal manner. As the season advanced other branches were affected, until the tree perished. No considerable amount of twig blight was present but a close examination of the trees showed several large areas of blighted tissues on the trunk and at the base of the affected branches. These areas increased until the tree was girdled, the starting point in every case being in the forks or crotches. The trouble was undoubtedly caused by the fire blight fungus finding lodgment in the forks from blighted twigs above.

It is now necessary to go back a step in this report in order to give conditions and impressions of the orchard at the beginning of the season. More attention has evidently been given in the past to the trees than to the land. The apple trees show that excellent care has been given them from the start or it may be better to say that in the *beginning* they evidently received close attention. Straight, clean trunks and well formed heads prevail throughout the apple orchard. The land, however, was badly ridged toward the trees, leaving deep ridges, depressions, in both directions between rows, and in most cases a patch of sod around the trees. I wish to say here that this implies no reflection on Mr. Herbst, Mr. Philips, or any one who may have had charge of the orchard in the past; for only a single season has taught me how nearly impossible it is to have work of this kind done properly by the kind of men who have had charge of the orchard, and by occasional visits.

The plum orchard, however, was in deplorable shape. A tough sod in this part of the orchard had evidently remained undisturbed since the trees were set, until the fall of 1903, when an attempt was made at plowing, leaving the surface in such condition that I had great difficulty in persuading Mr. Gensman to put his horses in to level it, fearing they would be injured. The trees (plum) were in bad shape from lack of pruning, suckers in many cases exceeding in height the trees.

Several days were spent in April in pruning and in removing dead trees.

Thirty trees were set, the ones received as gifts from Stark Bros. and Mr. Patten.

The orchard was cultivated frequently during the season and many days hand labor employed in removing grass and weeds from the spaces next to the trees.

Late in August the entire orchard was seeded heavily with oats for a cover crop.

A complete spraying outfit was purchased, consisting of a large pump and 250 gallon tank, hose, nozzles, etc.

The orchard was sprayed thoroughly three times,—April

27th, June 7th, June 22nd,—using altogether 2,500 gallons of spray mixture.

Time employed in spraying three times, four men, one team, seven days.

The first spraying was made before growth had started; the second just after the blossoms dropped, and the third two weeks later.

Bordeaux mixture combined with arsenate of lead was used in all sprayings.

The results afforded one of the most striking object lessons of the value of spraying I have ever observed.

The foliage was entirely free from scab and a very small percentage of the fruit was scabby,—probably less than 1%; in fact, the Longfield was the only variety showing scab at all.

If the codlin moth ever existed in the orchard it certainly was eliminated last season, for not a single wormy apple was observed in handling nearly 100 bushels of fruit. I do not wish to be understood as saying that there were no wormy apples in the orchard, but merely that I found none.

The plum curculio was very abundant and apparently was not affected by spraying.

The old lath tree protectors many of which were decayed or broken, were all removed and replaced by veneer where needed.

The following is a summary of the crop:

Duchess, fair yield; Hibernal, light; Okabena, light; Wealthy, very light; Longfield, heavy; Patten Greening, heavy; Northwestern Greening, no fruit; McMahan, very light. Other standard varieties light to fair.

One hundred and sixty-six bushels of apples were harvested, and it is estimated 50 bushels were stolen. The crop was disposed of as follows:

Sold in Wausau, 66 bushels; gave to school children, 15 bushels; gave to Mr. Gensman, his relations, and to Wausau people, 50 bushels; State Fair, Wausau Fair and St. Louis, 20 bushels; windfalls and rotten, unfit for use, 15 bushels; total, 166 bushels.

The different varieties of native plums all bore about alike, and a fair crop, but owing to curculio attack and lack of thinning the quality was poor. Twenty-two bushels were sold. Mr. Gensman was given as many as he could use, and several bushels were frozen on the trees.

The financial account of the Wausau orchard is as follows:

Disbursements:

Spray outfit, including freight and extras	$46.05
Spraying material	33.90
Tree protectors, including freight	15.58
Rent	50.00
Mr. Gensman, for labor	124.29
Expenses of superintendent, including express, freight, and labor employed, but not including railroad fare	58.51
Total	$328.33

Receipts:

Sixty-six bushels apples	$39.60
Thirty-three bushels plums	33.00
Total	$72.60
Balance, or net cost	$255.73
Cost, 1903	286.30

MEDFORD.

This orchard comprises but three acres now all planted. The soil is a friable clay loam well adapted to tree fruit culture. The orchard site is on gently rolling ground with a general slope to the south. One acre was planted in 1902, one in 1903 and the remaining acre in 1904. Less than a dozen trees were winter killed last year. The orchard at present contains 249 trees divided as follows: Apple 169, plum 70, cherry 10. The different varieties, number of each and location, appear on the chart. The trees all made an excellent growth last year as may be seen by specimens of the new growth shown here today.

One acre, the first planted was subject to clean culture during the season and seeded to oats in August. The remaining two acres were planted to corn and potatoes by Mr. Harris.

Tree protectors were placed on all the trees.

At first glance it appears strange that this orchard was located so near, less than 40 miles, from the Wausau orchard and with similar soil conditions, and yet if it succeeds, it will no doubt be a good investment for it is situated in one of the most promising counties of Northern Wisconsin. Although in the midst of hemlock forests at present, in time it will be among fertile, cleared farms. We must look to the distant future for returns from the Medford orchard.

Financial Account.

Trees	$44.70
Tree Protectors	1.50
Paid for Labor	14.75
Traveling Expenses	22.25
Total	$83.20

EAGLE RIVER.

This orchard is the most interesting of the four. The others are all located under conditions that may reasonably be expected to give good results, barring winter-killing. The Wausau, Medford and Poplar orchards may be considered more in the nature of demonstrations rather than experiments, but in the Eagle River orchard we have all the conditions and requisites for a beautiful experiment that would gladden the heart of a horticultural scientist. In fact, from present appearances it will take a lot of science to make any thing out of it. The soil appears to be pure unadulterated sand for an indefinite depth. There may be some of the original Devonian or later Potsdam formation somewhere below but neither is discovered at any depth that may be reached by a spade. The first acre was planted in 1901 and the trees made a remarkable growth. I am unable to state how many of these were replaced the following year. In 1902 and 1903 three and one-half acres were evidently planted but of these and the number replaced there appears no record.

During the months of February and March I endeavored to get a record of the trees dead but never succeeded. The best to be had was an imperfect record showing twenty-four trees dead.

On May 10th, I arrived at the orchard with 24 trees; a close inspection showed every apple tree in the orchard dead to within six or eight inches of the ground. A few crabs survived. Of the 20 or more cherry trees, all but six were dead. The native plums survived with few exceptions. My feelings at this time may be more easily imagined than described. The 10th of May and 24 trees with which to fill 400 holes!

A telegram was sent at once for 150 apple and 150 plum trees to be sent by express. These, with the first 24, were planted and mulched in one and one-half days.

The trees which perished were not root-killed, for in the removal the roots, and in most cases, the trunks for several inches were alive and sound.

From reports of the weather conditions there last March and April, I have concluded the trees were killed by the hot days at this time, followed by severe freezing at night. The few inches of snow remaining on the ground protected the roots and trunks.

About 50 of these top-killed trees were sawed off at sound wood and allowed to sprout from above the grafts. These will probably be the only trunkless trees in the state.

The orchard was very nearly a sod in the spring, cultivation evidently having been neglected the previous year. During the past year four and one-half acres were cultivated thoroughly and seeded in August to oats; the remaining one-half acre produced a good crop of hay which was cut and placed about the trees as a mulch.

Several pine stumps and other obstructions were removed at a cost of $24.

Several groups of shrubs were planted about the log cabin and at the entrance to the grounds.

Tree protectors were placed on all trees, except the trunkless ones.

Financial Account.

Trees	$112.45
Shrubs	18.60
Tree protectors	6.91
Traveling expenses, inc. express	39.78
D. E. Riordan, labor	197.50
Total	$375.24
Cost, 1903	236.21

POPLAR.

The Poplar orchard requires a briefer report than the others. Everything has been clear sailing here. A splendid orchard site cleared, plowed, and ready to plant with the stock on hand and nicely heeled-in were the conditions on my first visit, May 16th.

Certain criticisms were offered last winter concerning the expenses involved in locating this orchard, and personally I felt at the time that the point was well taken, but since traveling the highways and byways of Northern Wisconsin, particularly the length and breadth of Douglas county, following for some 200 miles the trail of the Committee, I am convinced that the bills were too small. The members of that committee were entitled to $100 apiece, "prize money" for selecting the grandest orchard site in Northern Wisconsin.

Fifteen acres of level ground without a stick or stone, strong, well drained clay soil; on the main line of the Northern Pacific Railroad, directly opposite Poplar station, it is doubtful if it can be equalled in Douglas county. The surface soil, after a thorough cultivation for a few years, is light and mellow, but the sub-soil cannot be properly described. It must be seen and handled to be appreciated. The sample here today will convey some idea of its texture. At one foot below the surface it might be burned for bricks; at two feet it could be used without burning.

Five acres, 489 trees, were planted during the second week of May, as follows:

Apples, 322; plums, 113; cherry, 54.

The varieties of apples are as follows:

Wealthy, Duchess, Okabena, Patten, Astrachan, Fall Orange, Utter, Willow Twig, Newell, Longfield, G. Russett, Tolman, Ben Davis, Haas, Scott Winter, N. W. Greening, Fameuse, McMahon, Malinda, Plum Cider, Pewaukee, Seek-no-further, McIntosh, Seedlings (6).

Cherries: 27 Montmorency, 27 Richmond.

Plums: Rockford, Forest Garden, Wyant, Desoto, Beatty, Hammer, Wolf, Surprise.

In addition, a border of shrubs 10 feet wide and 235 feet in length was planted along the northern boundary fronting the highway.

The orchard was cultivated thoroughly throughout the season and seeded to oats in August.

On October 15th, all the trees were alive, except 29, or a loss of a trifle over one-half of 1%.

Five acres more have been plowed, ready for planting next spring.

The government grant of lands to the Northern Pacific Railroad were exceedingly liberal, comprising in this section a strip 200 feet wide. Our orchard is, therefore, separated from the main line and the Poplar depot by a strip 100 feet wide. This ground has been used as a piling ground for cedar posts and cord wood, thus completely obstructing the view from passing trains.

Negotiations were begun with the Northern Pacific Company for the use of this land, and after much correspondence and delay a lease was obtained of this ground for 19 years for park purposes, with the proviso that we may place signs not to exceed four feet in height, stating that the land is leased and planted by the Wisconsin State Horticultural Society. If this plan is carried out the people on the Northern Pacific trains passing through Poplar will have a view of the only railroad park in Northern Wisconsin, and an unobstructed view of our orchard. Thus our Society may be known from the Atlantic to the Pacific.

If the Poplar orchard thrives, and there seems to be no reason why it should fail, it will prove the best investment ever made by the Society.

The people of Douglas county are interested and that means much. In the other localities but a few people know anything of the orchards, but every man, woman and child in Douglas county seems to know about the orchard, and to be interested in it. The Superior papers all give the venture hearty support.

Financial Statement.

Trees	$100.00
Shrubs	25.00
Rent	75.00
P. A. Peterson, labor	124.33
Sign	10.00
Tree protectors	7.58
Recording lease	4.00
Paid for labor	25.00
Expenses of superintendent	30.51
Total	$401.42

CONCLUSION.

On looking over the papers received from the ex-secretary, I failed to find any of the orchard leases. I finally secured all of them after diligent search, and recorded each in the county records of the respective counties. In addition, each lessee was furnished with a copy.

I found at Wausau an excellent map of that orchard, but of the others but imperfect records were found. A complete map showing the location of every tree has been made of the Eagle River, Medford and Poplar orchards.

Every tree in each of these orchards except Wausau bears a copper-wired wood label with the name of the variety. The records of experimental work done in the Wausau orchard are very incomplete. Fragmentary and incomplete records may be found scattered through the reports, but nothing systematic or definite.

Suitable spraying outfits should be provided for Eagle River, Medford and Poplar next season. It is not good policy to wait until the trees are in bearing before beginning to spray. Spraying is wholly preventive and cannot be begun too early in orchard work.

The work connected with the trial orchards has been the most satisfactory that I have ever undertaken. It is a grand work and the men who conceived the idea, the pioneers who set it in motion, should have their names engraved on everlasting bronze. I feel glad that I have been able to serve in a humble way in this work.

Sometimes, when bumping over the ties on northern roads or flying home by night to be on hand to catch up with neglected office work, I have wished the trial orchards several thousand miles further north—somewhere near the north pole—but before the season was over I came to love the work and I have come before you today converted, regenerated,—as big an apple crank as ever lived.

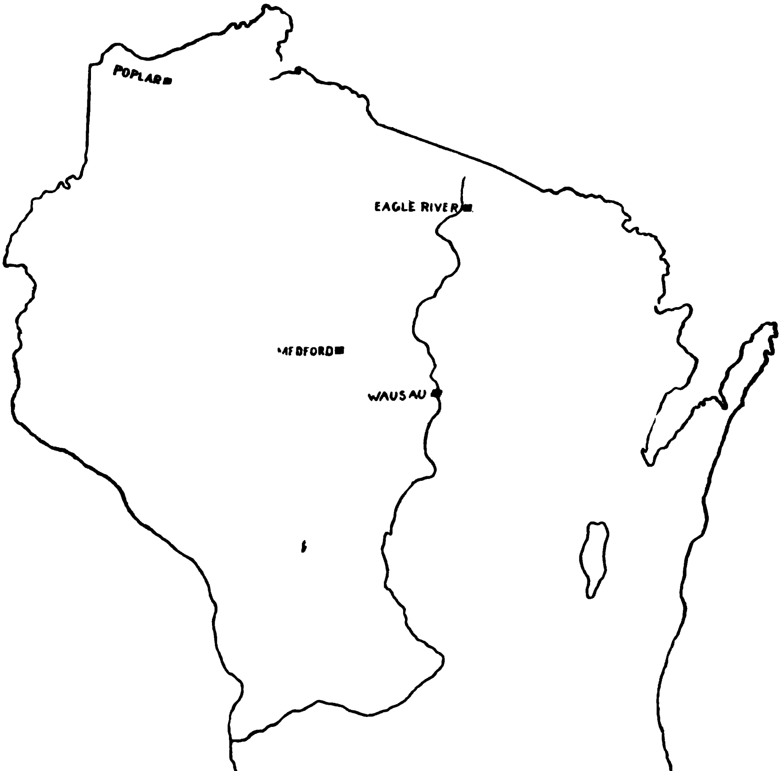
DISCUSSION.

The Secretary: I wish to show you some twigs from the Medford orchard. These twigs are about four feet long and they represent one year's growth. They were planted last spring. I also have some photographs I will show you of these orchards. I am pleased to say that Mr. Peterson, who is in charge of the Poplar orchard, is here, and Mr. Harris, who is in charge of the Medford orchard, is also here. I think we would like to hear from Mr. Peterson.

Mr. Peterson: I want to say right now, that I am not a horticulturist and neither am I a public speaker, and I think I can prove both propositions to you before I get through. I think you have brought me down here to learn something that will be of benefit in the future to the orchard at Poplar. The ground has been covered pretty thoroughly, and all I can say in a general way is, that we have a soil that is known as a red clay soil, we have a soil that, perhaps, is not found anywhere else in the United States except on the south shore of Lake Superior. It was originally covered with white pine, maple, white birch, and an undergrowth of balsam. The soil is very productive and gives good returns of most crops, especially clover, peas and things of that sort, but the only trouble we have is in raising fruit trees, although the farmers are trying to raise fruit trees, but it may be difficult on account of the subsoil. Six to ten inches below the surface it is almost impervious to moisture. If it rains a few days it will stay wet, and then when the sun comes out it will bake so hard that you cannot drag or break or pull it away. Instead of doing as the nurseryman told me when I planted the trees, to make a deep hole and set them in, I set them on top and piled the soil around them. I think the greatest trouble has been, our ground has not been understood, and at the present time we have demonstrated a good many things with reference to the soil that is of benefit. Mr. Cranefield says the people are very glad to have this trial orchard up there, and when I came to Superior they asked me all kinds of questions as to how the trees were getting along. The cherry trees were a long time on the way and looked pretty bad when I took them out of the box, and a good many of them died. There is one thing that is contrary to the general idea in regard to planting trees that I have ever read of, and that is that it is always the best plan to plant small trees. Up at Poplar exactly the reverse has been the case this last year. The largest apple trees were the Wealthy and the Northwestern Greening. There were twenty-five trees of each kind planted and not a single tree failed to grow. The same is true of plums and cherries. I can hardly say anything about cherries, though, as a large number died and those that lived did not do very well. I don't know that there is anything further I can say, and I think the greatest service I can do the Society, perhaps, is to go back and take my seat.

Mr. Geo. J Kellogg: Were those trees set on top of the ground?

Mr. Peterson: No, sir.



SHOWING LOCATION OF THE FOUR TRIAL ORCHARDS MAINTAINED BY THE WIS. STATE HORTICULTURAL SOCIETY.

PARTIAL VIEW MEDFORD ORCHARD 1904.

The Secretary: Those Poplar people tried to make me plant them on top of the ground, but I would not do it. The work has been very successful, and it has been done almost wholly by Mr. Peterson's efforts, and we hope he will continue right along the same line. This is a sample of the subsoil at Poplar; it is just as it was taken out of the ground. (Mr. Cranefield then exhibited a sample of the soil, which was cut in an oblong shape and which resembled in appearance and texture an ordinary building brick.) This is a sample of the soil; I use it as a paper weight and to throw at dogs. You can kill animals with it.

Mr. Peterson: In regard to that soil baking, etc., I think that is a trying problem that is going to confront us, to add humus to the soil, and it seems to me that is what we must try to do. It has been suggested that we tile drain, but I don't think the water goes down to the tile, for after the clay settles the water cannot get down.

Mr. Irving Smith: If Mr. Cranefield did not reverse the plan of planting them on top of the ground, how did he get the holes made?

Mr. Cranefield: Mr. Peterson made the holes. When I went up there I found them using spades like those used in setting telephone poles. I said to Mr. Peterson I wished he would buy a spade. He did not say much, but he got the spade, and when I tried to dig the hole with one I found I could not do it. Mr. Peterson knew what he was doing.

Mr. Geo. J. Kellogg: Is this a sample of the soil (indicating) from that Poplar orchard?

Mr. Cranefield: Yes, that is some of it. Don't you worry about the soil. The trees will grow.

Mr. Cranefield then showed some photographs taken of the several trial orchards.

Mr. A. J. Philips: How much of that kind of soil is there in northern Wisconsin.

Mr. Peterson: Where I live it is about eight miles wide; it is estimated to be from eight to sixteen miles wide.

The President: That basin runs from away up there by Ashland clear down to the St. Louis river.

Mr. Peterson: It is about sixty miles east and west.

The President: That is a condition I never saw before. How high are you above the level, Mr. Peterson?

Mr. Peterson: We are nearly four hundred feet above.

The President: That basin has the general characteristics spoken of here in regard to soil.

Mr. Cranefield: I would like to introduce to the Society Mr. Harris who cares for the Medford orchard.

Mr. F. Harris: I feel very much as Mr. Peterson did in regard to making any public report. I am not a public speaker, but I will say in regard to the little orchard that is in my care, it is making headway, and as your Secretary, in his report, has given you the condition of the orchard, I can simply say that the orchard is in just the condition described, just as if I had made the report myself.

This is the first opportunity I have had to meet you in the winter session, because especially at this time of the year I am hardly able to get out, and I protested this time against coming, but I thought it was my duty and now I am glad I came. The soil in the orchard is reasonably fair and lies well, but I think we would be in better condition if we could have some tiling in this orchard. I had written to our Secretary that if the Society thought the orchard would do better by tiling I would put in the work and do what I could to get it well tiled. We have a good degree of surface water in that section of the country, and in places we get too much rainfali, and it seems to me if we had tiling there we might regulate the effects of the rainfall so as to get an even growth of trees and not have so much water standing on the soil. I believe the growth of trees is too much in one season. I have not had experience in cutting back. I have had considerable experience in selling trees and know something about cutting back, but keeping trees in the right form I don't know anything about. I thank you very much for the privilege of meeting and talking with you.

Mr. Irving Smith: This gentleman has spoken about tiling an orchard, and I want to bring out a point for your consideration in reference to tiling an orchard. It has been my experience up our way that wherever there were tiles laid in the orchard, and if only for a few years, when they were taken up they would be found filled solid with roots. Would not that be the case in this orchard? I have seen them send men to dig them up where the tiles were filled solid with roots from elm, poplar and trees of that kind, filled to such an extent that the water would be entirely obstructed, and would not that be the case in this orchard in a few years' time?

Mr. W. B. Cole: I would like to say that I am glad Mr. Smith brought up that question in regard to our locality. I know an orchard that has been planted the last ten years over a piece of land that has been tiled, and three years ago the owner had to take up the whole thing. The tiles were entirely filled with roots and no water could pass through them.

Mr. Roy Underwood (Minn.): It possibly was brought out in the report, but I missed it if it was, but I would like to know what the general policy is in regard to cultivation, and the method of cultivation.

Mr. F. Harris: The orchard to which I have referred, and which I am trying to take care of, has been cultivated with the disk and by summer fallowing. The two acres shown that were later planted to trees were first planted to corn and potatoes and well cultivated.

Mr. Peterson: This five acres of trees that I planted last year was on clover sod and had been cropped three or four years. There were some stumps there which I dug out, and plowed it in the fall, September, I think, and in the following spring I put on a disk harrow and disked it about four times, two times each way, and then I went over it several times with a straight tooth harrow, so it was fairly smooth. I think I put a roller on, and then I harrowed it again. In cultivating it, I went over it with the disk harrow when the weeds began to appear and then smoothed it over with the harrow.

The President: How far north is Poplar from here?

Mr. Peterson: Three hundred thirty-six miles by the nearest route over the Omaha railroad.

The President: I wish you could see what the people are doing three hundred miles north of this. I saw fruit trees growing in the city of Superior just as fine as any I ever saw. I also saw their fruit. I do not know what variety of fruit they were. The bark of the trees was perfectly smooth. I also wish to say that on the 23rd of July, when we were there, they were picking strawberries.

THE WISCONSIN FRUIT EXHIBIT AT ST. LOUIS.

A. A. Parsons, T. E. Loope, J. J. Menn, S. H. Marshall, W. S. Hager, Wm. Toole, Geo. J. Kellogg, and Frederic Cranefield.

REPORT OF A. A. PARSONS.

Superintendent of the World's Fair Exhibit.

Mr. President, Ladies and Gentlemen of the Wisconsin State Horticultural Society:

It would impossible for me at this time to cover all my work at the World's Fair in St. Louis. A more complete report of that work will be found in the Secretary's office.

I left my home in Omro accompanied by my wife, on April 21st, and arrived at St. Louis on the 22d. On the 24th, I reported to Mr. Taylor. I found that our permanent tables in the Horticultural Building had just been painted. There was considerable work to be done in our booth before we could install, but owing to the neglect or the indifference of other parties, for which none of us were responsible, I was delayed for several days in getting things in order. I felt very much disappointed in the World's Fair at that date. I found it very difficult to have the things which I needed admitted to the grounds.

I examined our fruit in storage, as much as possible, and found that most of it was in very good condition, excepting the McMahan. This variety, as far as I was able to judge, was in bad condition. The first fruit taken from the storage was on May 12th. At that time all the states had great difficulty in getting fruit admitted to the grounds owing to the Service Company. Fruit was often left standing outside of the grounds for forty-eight hours. After the first month, many of these evils were corrected.

There was great variation in the keeping qualities of the same varieties. In some cases it was easy to understand the cause, while in others it was difficult to find the reason. For instance, on the 12th of May, I found the McMahan, which was packed in the best possible manner by Mr. L. G. Kellogg, to be almost worthless on the 30th of July. I opened two boxes of the same variety packed by Mr. Bingham and the contents were in almost perfect condition. Who can explain the cause of this difference? Is it soil influence or must the fruit be in a certain condition when packed? Who of you, who have had experience along this line, can explain the cause of this difference? The varieties which kept best in storage were the Pewaukee, Wealthy, the Ben Davis, the Windsor, the Golden Russett, the Flushing Spitzenburg, and the Snow. The N. W. Greening, I believe to be a poor storage apple. The Duchess Pear was taken out on the 30th of July and found to be in fine condition. A seedling pear from Mr. Moyle on the same date was in fine order. A box of Fameuse on July 11th were in fine order and proved to be good samples. This box was packed by Mr. Marshall. One of the most attractive fruits was the Lowland Raspberry, from Mr. Bingham. I think it would be almost impossible for one grower to overstock the market with this variety. The N. W. Greenings from Mr. Menn were the finest I have ever seen. The White Transparent and a plate of new Seedlings from the same place were extra fine.

A box of Sweet Russett, shipped by Mr. Toole, was admired by many. The Wolf River from Mr. Howard were the finest that we had. Still the Wealthy and the McMahan found many friends, and four different seedlings from Mr. Cranefield are worthy of your attention. I also received some beautiful flowers and ferns from brothers Toole, Loope, Kellogg and Cranefield.

None of the plums were admired as much as the Surprise, from Mr. Marshall. They were the finest that I have ever seen of that variety. The Freeman, from the University, with its high, glossy color combined with its long keeping qualities, is certainly a valuable plum. The Golden Egg, from Mr. A. L. Hatch, received its full share of admiration. I believe that the above varieties are valuable for commercial purposes.

Most of the small fruit came in good order, and certainly, much better than I had expected from the way it was handled by the Service Company. The Eldorado B. B. from Mr. Hanchett appears to be a good shipping berry. The only defect which I noticed, was its tendency to turn red, somewhat like the Snyder. This may not be generally so. Mr. Hanchett can tell us about that.

The largest number of plates of fruit on our tables was 1,400. We had 87 varieties of apples, 81 of plums, 4 of crab apples, 7 of New Seedling apples, 4 of pears, 2 of cherries, 5 of strawberries, 4 of currants, 1 of gooseberries, 1 of B. raspberries, 1 of R. raspberries, 1 of blackberries, 1 of blueberries, and 3 of cranberries.

With this large amount of fruit to care for, and the many other things to look after, I often found it more than my wife and I could do to have the work done as it ought to have been done. As for hiring help, that was impossible like many other things on the Fair grounds. They all wanted two prices and gave as little as possible in return. For those of you who assisted us at different times, I have only words of praise. I believe that they did their duty by you and your exhibit just as they saw it. Their presence and their words of cheer were certainly encouraging to Mrs. Parsons and to me. Apple Day, the 4th of October, was a day long to be remembered by my wife and myself. The programme, as arranged by the committee for that day, as generally was the case, did not go as planned. But you had your share of honor, being the second state in the amount of fruit given away. Mrs. Parsons covered herself with glory by passing out twenty-three barrels of apples, continually calling, "Wisconsin Wealthies." Here again came the good results of the thoughtful care of your Secretary, Mr. Cranefield, in devising a perfect scheme to advertise your fruit. The outside wrappers used by other states, no matter what was printed on them, received no particular attention, while the paster devised by your Secretary stuck tight and was read by all. Professor Stinson said of the advertising scheme, "Wisconsin has the finest goods and the most complete way of advertising their fruit of any state in this building."

Mr. President and Gentlemen: I must say a few words in regard to the amount of work done by your Secretary. None of you know as well as I do, the amount of work that that gentleman did. Nearly all the fruit and other things which I wanted from Wisconsin I ordered from him. Not once during the entire season did he disappoint me; always prompt in returning, many times giving good advice; always hopeful and cheerful. How he ever covered so much ground outside of his regular duties in gathering so many samples of fruit and other things, is more than I can understand. But he did it and did it well. In all candor and justice to Mr. Cranefield, I must say that whatever success we may have had at St. Louis, a great share of it was due to his untiring efforts in your behalf.

Superintendent of Pomology, Stinson, was the first friend whom I found on the Fair grounds. That friendship increased and continued until the end of the season. He was a thorough gentleman, and always kept in touch with each superintendent in the building. He was always ready to advise and to grant all possible favors. He is a man whom I admire very much, and a vote of thanks is due him from the Society. As to our success at the World's Fair, that is not for me to judge. The many words of praise from visitors, will be found on record in your visitors' register. They, and a letter which I received from Mr. Stinson, speak with more effect than anything which I could possibly say.

Respectfully,

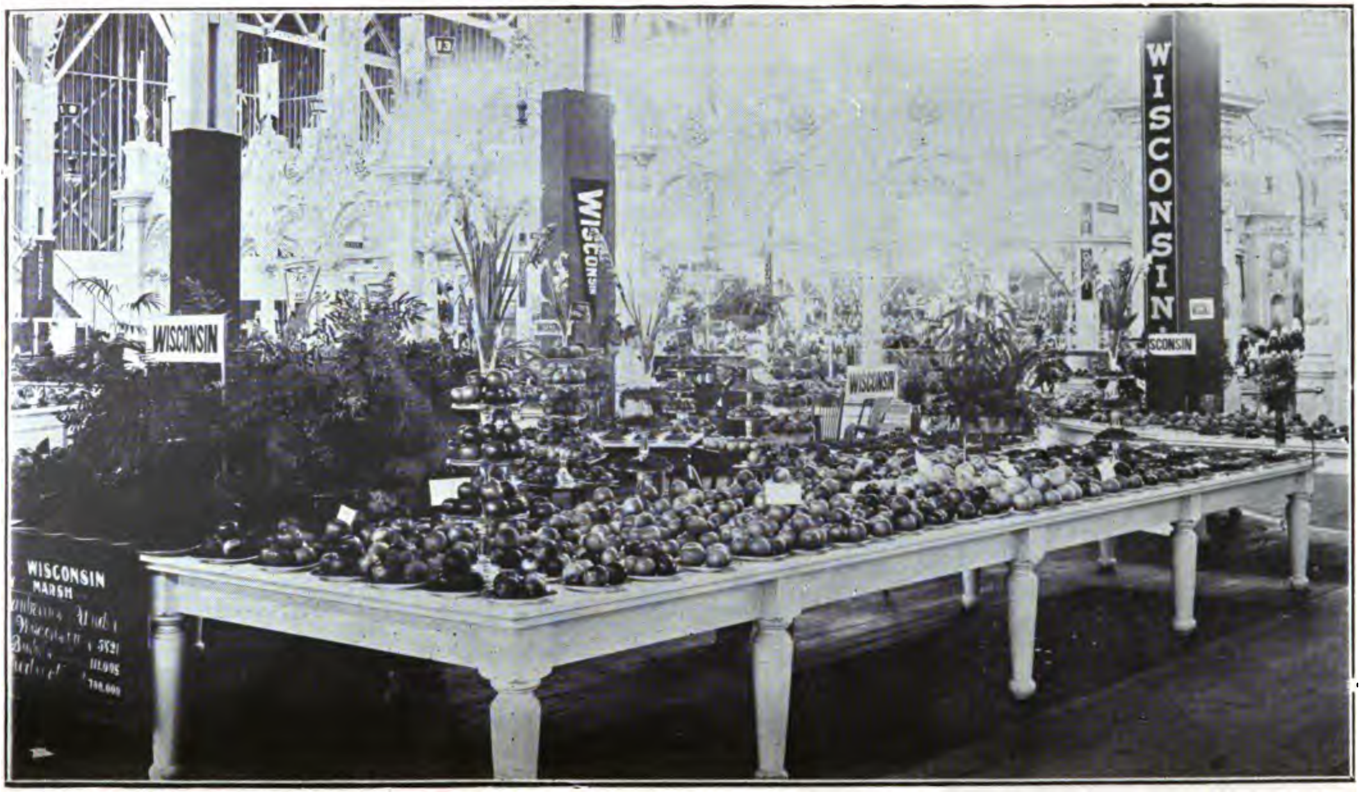
A. A. PARSONS.

Mr. Roy Underwood (Minn.): We shall claim a fair amount of credit for the Wisconsin horticultural exhibit at St. Louis. The longer I stay with you the prouder I am of showing the Wealthy apple. We are glad to see the good use to which you put them, but I assure you, you paid us the best compliment you could have paid us, by exhibiting a Minnesota seedling, and we are glad of it. (Applause.)

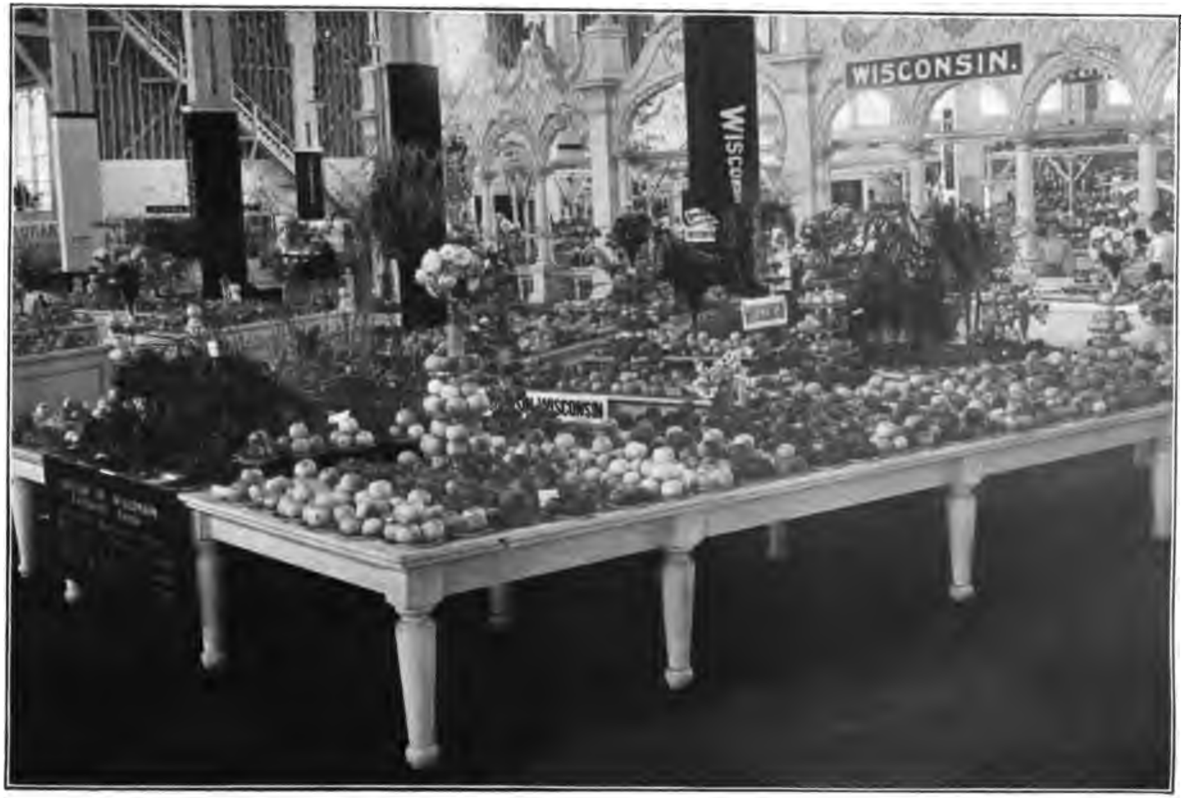
The President: I can partly account for that because I am the Wealthy crank of the Society. I got those apples together and our friend, Cranefield, your Secretary, sent me wrappers and posters, and I employed some women to wrap them. There was printed on the wrappers, "This is the Wealthy apple. With compliments of the Wisconsin Horticultural Society." That was the best showing apple there, and we wrapped them with these wrappers which you will see before you go away. They distributed twenty-three barrels of apples that day, and as I understand it, there was no state except Missouri that distributed more. I took the Wealthy because I thought it was the best apple, not because it was a Wisconsin seedling or because it was grown in Wisconsin.

Mr. Geo. J. Kellogg: I think it is due the Society that we hear from the President now regarding the Wisconsin exhibit.

Dr. T. E. Loope: My report can be made in a few words. I was down there three days during the time of the fair, then I got sick and came home. I believe Wisconsin made a fine show. My belief is based on what I saw when I was there, from the reports I got from those who had been there and those who were in charge of the exhibit. Other than that I know but very little about the exhibition except from the reports I got from those that were there as I have stated. I do not wish to take up any of your time, this has been thoroughly gone over, so I do not care to say any more upon the subject.



WORLD'S FAIR FRUIT EXHIBIT, AUGUST, 1904.



WORLD'S FAIR FRUIT EXHIBIT, OCTOBER, 1904.

Mr. A. J. Philips: Talking about giving credit to other states, I asked the Iowa people after I found half their apples were Wisconsin and Minnesota seedlings (and Yahnke kept urging me to ask them) and I asked them how they would have made an exhibit without the help of Minnesota and Wisconsin. One man got up and said, "We showed you one thing. We Iowa people showed you that we can take your seedlings from the north and grow them and beat you fellows." I said, "I am not so sure about that. I have been told on good authority that most of those apples on your tables, the Northwestern Greening and Wolf River, were raised in Trempealeau county, Wisconsin, sold to a Minneapolis commission house, and bought by an enterprising firm in Iowa and shipped to St. Louis," and no one denied it. (Laughter and applause.)

Mr. S. H. Marshall: I have not much to say. I have heard our President say how he furnished Wealthy apples, and heard our Vice President say how he arranged the apples to attract everybody's attention, and I want to say that I think we got a great part of our success, whatever it was or whatever we got out of it, was due to Mr. and Mrs. Parsons, and I want to emphasize right here and now that the credit we got down there, the great part of it was due to the able manner and conscientious way in which they took care of that exhibit. I have nothing further to say.

Mr. Frederic Cranefield: My report will be of about the same length and about the same style as that of the President. He says he went down there, stayed three days, became sick and came home. I went down the same time, got sick, stayed three days, and came home. I fear it would take a longer time than you would be willing to give me to tell you all about the World's Fair fruit exhibit so far as I know about it. My work was almost wholly from this end, and during the three or four days I was there I was very favorably impressed with our exhibit; I felt that there were no other states that had any better exhibits all things considered. My work lay in getting the apples. My duty was to supply small fruits first and afterward the apples for the exhibit, and we searched Wisconsin from one end to the other and tried to get the best we could for the money. You might be interested in the financial end of it. I might give you that report if I had my books. I will say that we spent $5,000 of the appropriation of the state commission and we also spent nearly $1,200 of our own money in arranging the exhibit, after considerable talk from members of the commission that we were spending too much money, but we were using it to a good purpose. We spent nearly $1,200 of the Society's money in maintaining the exhibit. I don't think any of you will regret it. I don't know that I have anything further to report.

Mr. Geo. J. Kellogg: In what condition are the medals?

Mr. Cranefield: There have been no official awards made, and I have been assured there will be no official awards made coming directly from the commissioners. I insisted all summer that whatever medals should be awarded should be awarded to the State Horticultural Society and not to the individuals who furnished the fruit, because those individuals were paid full price for all the fruit they furnished and for all the time they used in packing that fruit, the express was prepaid and they were under no expense whatever. I see, however, that I was wrong, and later in the season I received a list of awards of medals awarded to members of the Wisconsin Horticultural Society.

Mr. Parsons: That was taken from Prof. Stinson's list.

Mr. Cranefield: There have been no official awards made. Greatly to my surprise I found that most of the awards granted were awarded to individuals and not to the Society. There was one grand prize to the state and one for installation. Then followed a list of twenty-five or thirty gold and silver medals awarded to the different parties who furnished fruit. I immediately began to raise a row from one end of the state to the other. I began with the chief of horticulture at St. Louis and ended with Mr. Parsons. I will say right now that Mr. Parsons was not to blame for that matter, he did things right so far as entries were concerned, but all my labor was lost, and although I attempted to create considerable trouble it did not amount to much. After a time the names will be presented and we will all learn to whom medals were awarded. I am not jealous of the fellows who got the medals. They are entitled to them because they gave the fruit, but I was working for the State Horticultural Society; that was in my mind that the Society should have the awards. I hope my position will be understood. It was not because I did not want you to have the awards, but I wanted the awards to go to the Society. It was explained to me that no organization can receive an award. The highest award any society can receive is the grand prize, and if there are medals for fruit those awards must go to the producer. A partial list was sent to me by Mr. Parsons, and it is at my office at this moment. I cannot read to you the awards of gold and silver medals, but nearly every man that sent fruit there was granted a gold, silver or bronze medal. The thing looked most ridiculous to me, and the most ridiculous feature of all was the awarding of a medal to F. Cranefield. What in thunder did he do! I don't know yet. The nearest I can get at it is that I bought some fine cherries and sent them down to Mr. Parsons to decorate the booth with, and the worthy commissioners awarded me a medal, and I am going to hang it on the wall.

Mr. Geo. J. Kellogg: What is the grand prize?

Mr. Cranefield: It is not a gold or silver medal; it is something in the nature of a diploma.

Mr. A. A. Parsons: It is a very beautiful emblem; I could not describe it, but it is beautiful to look at.

Mr. Cranefield: I have been told that four other states were awarded the grand prize, so Wisconsin is one of five.

The President: I don't know much about it, but I guess every state and county got a grand prize. (Laughter.) The grand prize, if it is worth anything, will probably cost you $500 if you get it. I only make a guess at that, I don't know anything certain about it. The gold medal will cost you $175 if you want it, and a silver or a bronze medal will cost in proportion.

ST. LOUIS EXHIBIT.

J. J. Menn.

Mr. President, Members of Society:

I herewith present my report of assistant superintendent of our Wisconsin fruit exhibit at St. Louis exposition from August 29 to September 13th and 14th. Left home August 29th, accompanied by my daughter Ella and two of her lady friends. We arrived in Chicago on the morning of the 30th, and from there went by way of the Wabash road to St. Louis, arriving at 7:30 P. M.—a couple of hours late—tired after a sultry and hot day's ride in an over-crowded car.

I had previously written Brother Toole, who was then at St. Louis, to meet us at 3:45 P. M., but we failed to find him or he us (he being there); so we took a Laclede car for Garrison avenue, telling the conductor to call the avenue. He did so by number, and we not knowing the number were carried by a mile and had to return. We finally found Mr. and Mrs. Parsons and received a hearty welcome from them. Later we secured our rooms and were glad to rest after an exciting and eventful day. I had heard so much of the beautiful farms and homes of the great state of Illinois, but was very much disappointed in traveling from Chicago to St. Louis. They certainly have fine farms, but the homes and farm buildings are not as good as they might be, and will stand no comparison with our Wisconsin homes.

On the morning of August 31 we paid our first visit to the exposition, entering through Western Heights Gates, this being the nearest to Horticultural building. This building was very large, but to me it seemed not as attractive in its architecture and inside arrangement as the Chicago building. I did not see the Pan-American building at Buffalo, but heard it was ahead of both Chicago and St. Louis.

It took me but a minute after entering to find our Wisconsin exhibit. I want to congratulate our committee in securing the space they did for our exhibit, although a little more room could have been used to good advantage during the last half of the exposition. But we were better off with the limited space so centrally located than double the space east or west of us.

The exhibit I found in fine shape with Mr. and Mrs. Parsons in charge and Wm. Toole and L. G. Kellogg assisting. Everything was very clean and free from dust, and flowers, ferns, vines and grasses very artistically arranged to make the best possible show.

About 25 per cent of the apples were cold storage. The rest of our early varieties principally Duchess, varying in size from the smallest Siberian crab to our largest Duchess; in all colors, from white to darkest red. There was also a good supply of ground cherries, elder berries, Indian turnip, etc. The cranberry bog with native vines loaded with fruit looked fine considering the time it had been there.

Learning that Brother Toole was to assist a few days longer after my arrival, I put in my time with the ladies in sight seeing. Afterwards I put in my time for the Society. I had observed that there was lots of work for Mr. and Mrs. Parsons and assistants, for they were kept busy all the time in unpacking new fruit, placing it on tables, entering same, dusting all fruit, answering questions, etc.

On Friday I commenced to work in earnest, and learned that but a few boxes of apples had arrived in the last few days and the cold storage fruit was losing its attractiveness very fast. We were anxiously awaiting the arrival of a fresh supply of apples that we knew were on the way, having received notice to that effect from our Secretary, Mr. Cranefield. The apples did not arrive but in place a good supply of very fine plums came from Mr. S. H. Marshall and from the Experiment Station at Madison, and we were somewhat relieved from our anxiety on Friday evening, and on Saturday morning more plums were received from the same parties, also from Mr. Hatch and from Mr. Bingham of Sturgeon Bay. No apples being in sight for Saturday, Mr. Parsons said that we would make a plum show, and a plum show we did have, I assure you. After all had been placed on the tables there were nearly 300 plates of as fine a lot of plums as eye could wish to see. From the whole lot only a few had to be culled, and to all of you who shipped plums during my stay I must say you exercised very good judgment in picking, packing and shipping, and are entitled to words of praise.

There did not seem to be much difference in the varieties as to their keeping qualities. Of the blue varieties, the Guie kept well; of the reds, the Surprise, but on the whole there was not more than a day or two difference. After being 4 or 5 days on the tables they had to be replaced.

No apples arrived Saturday morning. Mr. Parsons and I thought best for him to go to the Mound City cold storage and look over our supply to select the best on hand. He did so. Out of some 30 boxes he ordered a dozen to be sent by Monday. On Monday we were there bright and early, knowing that a hard day's work awaited us. As soon as the express company began to deliver, we got our supply of the cold storage fruit. Then came the delayed apples, some from Parsons & Loope, Eureka, from Harland & Steele, Waukesha, from D. S. Bingham and from C. A. Hatch, Sturgeon Bay, from Wm. Toole, Baraboo, and from J. J. Menn, Norwalk. About one-half of this shipment were McMahans, the balance consisting of our fall varieties. To tell the truth we were almost swamped with apples.

We thought best to examine the cold storage fruit, and opened every box, finding nearly all in bad condition. A great many boxes being so badly decayed as to make them worthless. Where the fruit had been scabby, it looked as if the scab had grown 100 per cent during the storage, so we decided not to use any more cold storage fruit, and took all such fruit from the table, filling up with new fruit. It took us two days to rearrange and get everything in the best possible shape. From this time on we always had a good supply of apples, plums and pears. We used every inch of space displaying all the fruit, and had 1,000 plates of apples, 300 plates of plums, 25 plates of pears and a goodly number of plates of ground cherries, and elder berries. The center tables held glass pyramids filled with the choicest apples artistically arranged as to size and color and crowned with Wisconsin flowers and Missouri grasses that

Mr. Parsons would gather in the Missouri bottoms on his way to the grounds in the morning. Many a native of that state wondered what new variety of grasses Wisconsin was exhibiting.

Our exhibit attracted much attention and we were complimented on the same every day from people of the United States and foreign countries. The beautiful and highly colored fruit with the aroma arising from it that filled the aisles surrounding our exhibit held the people, and they would say, "Oh, what a beautiful exhibit and from away up in Wisconsin where we thought they could not grow fruit! Why, it's the finest in the building."

One afternoon, being alone, two gentlemen came down the East aisle of our Exhibit and stopped. I heard them converse in German; being a German myself, I was attracted by what they said. I noticed that they were two jurors of the German Department. I heard them say: "Wisconsin, Prachtful eins der shonsten Früchte austellung im gebende." Translated, "Wisconsin. Wonderful! One of the finest fruit exhibits in the building!" That I was pleased don't express it. I invited them in to our booth, and showed them all we had, and treated them to the best we had, and they left pleased.

An other time, an elderly lady from the South, came to me in dead earnest and said, "They tell me you people have treated all of your fruit with a preparation of poison to preserve it and make it look so attractive. Is this true? I told her it was not, that it was our Wisconsin soil and climate that produced this fine fruit. Many more instances similar to above could be given.

The Moscow apple sent by Mr. A. D. Barnes, of Waupaca, attracted much attention from its beautiful color, also the Red Russett sent by Mr. Toole, of Baraboo. Nearly all the apples received were fine, with few exceptions.

Many questions being answered to Southern ladies; they being very much interested in our ground cherries, and many a cherry was carried home by them to plant the seeds.

Another attraction was our booth with half dozen chairs, that were always occupied by tired and weary people, where it seemed so home-like to all. Mr. and Mrs. Parsons were very entertaining, and all Wisconsin people were given an apple, while our neighbors would lug their spotted fruit to the "Call Stands" and, probably, received a little hard cash for it, but Wisconsin is none the worse off for its generosity in giving away its specked fruit.

I found our Southern people very sociable and entertaining, much more than I had expected, and will long remember the pleasant conversations we had.

Mr. and Mrs. Parsons were always on hand attending to their duties, and they treated me very kindly.

So much of our success is due to our Honorable Secretary, Mr. F. Cranefield, who kept tab on all shipments of fruit and knew where to get the best; there always was so much work for us to do to have everything as it should be, that we did not have the time to take in the sights as I would like to have done. I was aware that we were getting to the front with our exhibit with both feet, and departed for home the evening of September 13, leaving the exhibit in fine shape, pleased with my time spent at the great Exposition.

Thanking the Society for the opportunity given me in assisting at our exhibit.

Wisconsin Fruits at St. Louis Fair.

By Geo. J. Kellogg.

Mr. President, Ladies and Gentlemen:

Under difficulties was our fruit first put on show. We had sent about 600 boxes to cold storage in 1903. It was a long way from the Fair Grounds, there were many delays and hindrances on every hand; but A. A. Parsons and his wife were equal to the occasion.

When I arrived at St. Louis, October 11th, there was as fine a show of 700 plates of fruits as I ever saw, consisting largely of apples, with pears, grapes and cranberries; and the tables were further ornamented with ferns, wild plants and flowers.

Mr. Parsons permitted me to select from the 700 plates of apples twelve varieties, one hundred and thirty-three plates, and arrange them in prismatic colors, as far as possible, in nineteen rows on the most prominent table; each row a kind and color all its own. The passing crowds stopped to admire, and said ours was the finest show on the grounds. I think for the amount of table room we had, no other state made a better show. Our fruit was massed and in colors; we had no waste room; everything was dusted and freshened every day. Some days barrels of fruit would take the place of that that looked dull and dingy. This work was too much for two, and the ten days I was there were not idle days.

Our fruit excelled in size, color, freshness, and artistic arrangement. Other states had much more fruit and some too much table room, and their fruit set far apart, while ours was massed. Some had whole tables of one kind, while we arranged in colors more attractive. Some retained cold storage fruit until October, while we aimed to clean up everything as fast as it became dingy and dusty. Quite a number of other states had larger apples but we had more kinds, and Northern fruit always colors best. After I had arranged that table in colors I made a special entry of it as an artistic display, whether it helped win medals I know not, but it won the admiration of the crowd.

I am very much pleased with the awards to Wisconsin on fruits. But after all, does the glory and medal baubles pay the expense? It is an honor to make so satisfactory a show of fruits among so many states that have so many more advantages and climatic surroundings than Wisconsin. We can assure the lovers of fruits that Wisconsin has millions of acres of orchard sites yet unplanted, as favorable as those which furnished our best fruits for St. Louis.

We have the hill sites to win: We have the right to glory in our success; glory in our SMALL fruits which are BIG; glory in Wisconsin seedlings, which are sought for all over the world; glory in our native plums; glory in our cranberries; and glory in our men and women who place our state always and in every thing at the head.

WISCONSIN'S FRUIT EXHIBIT AT THE ST. LOUIS WORLD'S FAIR.

Wm. Toole.

I reached St. Louis on the morning of August 19th and soon found my way to the Fair grounds and to the Horticultural Building. Wisconsin's fruit exhibit was soon found in that large building without being inquired for. Not only were signs conspicuous but there is a distinctiveness in the arrangement of our Wisconsin shows which easily leads us to our own. Desire to see familiar faces allowed but little time to admire Superintendent Parsons' tasteful blending of flowers and ferns with the contrasting shades of the many varieties of apples and other fruit which we had on exhibition. The Superintendent was obliged to attend to other matters for the time, so Miss Eva Loope was the one in charge. Very soon two were busy removing superannuated fruit, dusting plates, rearranging disturbed portions and answering questions of visitors.

In a short time Superintendent and Mrs. Parsons joined in the work and all were busy, for we were near the close of the week, when we must prepare for the opening up of cold storage fruit on Monday. There were times in the week when all hands were kept pretty busy. The first half, the last half, and the middle.

The condition of cold storage fruit furnished some surprises, and it was gratifying to note the good results with cold storage fruit of some of our best varieties, Wealthy and Fameuse. We may expect some valuable lessons from our Superintendent's notes of the Wisconsin State Horticultural Society's experience in the cold storage of apples.

The small fruits were disappearing but there were still on hand blue berries, currants, raspberries and gooseberries, while blackberries continued to arrive.

Some of the new crop of apples were already on the tables and daily during the week there was an increase of quantity and variety. It was interesting and sometimes aggravating to note the difference in judgment on opportunity or different collectors, yet there was only a small percentage of that sent in, which could not be used. Cold storage fruit and early varieties needed frequent renewals. This attention, with dusting fruit, cleaning tables and plates, making entries, and records, notification to judges, reports to Superintendent Taylor's office and, perhaps, of most importance of all, answering questions and entertaining visitors, kept the attendants very busy. Careful entries were necessary to secure to Wisconsin her many prizes. Each lot of fruit was entered in the name of the Horticultural Society and again in the name of the individual grower. This arrangement gave the Society all the premiums it could secure which with the rewards to the growers summed up a nice showing for the state. Some states, for instance, Michigan, made entries on the same fruit in the name of the State Society and the district society, also of the local society and the individual grower. We all know that these awards amounted to but little except the pride we have taken in the announcements in the papers at the time that the awards were published.

Of much greater importance to us was the judgment of the visiting public and measured by the attention our exhibit attracted, and the many compliments our Wisconsin fruit received, we had reason to feel that Wisconsin was well repaid for the expense and labor involved in showing to the world our state's horticultural capabilities. A full record of all the compliments bestowed for the beauty of our fruit and attractiveness of the arrangement would make a large and interesting album.

I will here venture the opinion that the fruit exhibit of the Wisconsin State Horticultural Society, attracted more attention, drew out more questions and expressions of admiration, gave out more information regarding Wisconsin's resources as a home state, and inducements to home seekers than did all of the other Wisconsin exhibits, not mentioning our live stock show which the writer did not see.

Plums soon came in abundance and apples in greater variety. Our varieties which are of special value to Wisconsin were studied by fruitmen of other states, and we showed our Wolf River, Newell, N. W. Greening, McMahan, and others in contrast with the same varieties grown in other states. Flowers, native and cultivated, we had from Wisconsin; also at various times a good showing of our native wild fruits. These, in the hands of Superintendent Parsons made, with our cultivated fruits, a showing which we would not willingly exchange with any other. We had a goodly share of Wisconsin visitors during the short time I was there. Treasurer L. G. Kellogg encouraged us with his presence for a short time and J. J. Menn in due time came to take the place of the writer.

Two weeks were spent in helping with the fruit show and another week in seeing the exposition and when we left, the only regrets were having to say good-bye to the Wisconsin fruit exhibit.

TWO WEEKS AT ST. LOUIS.

W. S. Hager.

It was my pleasure to be with the exhibit during the plum season, the last half of September. Probably one of the most surprising to visitors from neighboring states as well as from our own, was the display of European varieties from Sturgeon Bay, some of which we took a malicious pride in showing to our neighbors of the California exhibit.

The Monarch, Purple Egg, Gages and Lombards certainly were a credit to Wisconsin.

S. H. Marshall sent some excellent improved natives, among which the Surprise seemed to just about suit my taste.

Nor must I forget to mention the collection of natives sent from the University orchard of over 60 plates, which attracted the attention of the professionals of the Northwest states.

Of apples, the Wealthy and McMahan made our largest display, with some N. W. Greening and Wolf River, and also some Duchess and other earlier sorts still on the plates, and we were still using the cold storage.

I must not forget to mention that we received one lot from within 16 miles of Lake Superior, Two lots of grapes came in the last days. One of seven varieties, all of which were well ripened.

In closing I must not forget the melons, wild fruits and berries and flowers sent by Brother Toole, which added much to the attractiveness and decoration of the display.

THE RANUNCULACEAE--THE CROWFOOT OR BUTTERCUP FAMILY OF WISCONSIN.

By Alletta F. Dean, Ph. M.

The Crowfoots form a large family with many "sisters and cousins and aunts," often varying from one another so much in appearance that it is difficult to believe them in the least related until you have compared their structure. Nearly all that are known in any part of the United States are known in Wisconsin. The mummies of thirty-five species of Ranunculaceae are in the herbarium cases of the University of Wisconsin.

As in many other large families there are black sheep found among the Crowfoots. The poisonous Hellebore and Aconite belong in the order, but neither grows in our state. We have the bane-berries, however, both red and white, with their large attractive berries which are decidedly unpleasant in their effects, though not dangerously poisonous. Many of the family have a sharp, biting juice when fresh, but its sting is gone when the plant is boiled or dried. Some are medicinal, like the goldthread, and hydrastis or yellowroot. Very few of them have any fragrance. The family is very rich in ornamental plants, that are well worth cultivating in our gardens.

But let us start out and call upon some members of this big family. We shall have to begin very early, when "The year's at the spring," to greet the first-comers.

Here it is, March twenty-fifth, on the prairies near La Crosse. Chill is the air; snow-banks still linger on the north side of things; a few last year's weeds blow about, and rattle their dry bones in the March wind; there is not yet a blade of green grass; from a distance no sign of spring's awakening can be seen in all the plain. But look closer and you will find the dearest, softest, fuzziest, of little oval, pale purple buds, an inch or more long, pushing up through the dead weeds and grasses. Each plant has but one bud, and there is no sign of leaves yet, except the much divided silky involucre which encloses the bud. Presently you will come upon the open blossom with its one row of flower-leaves making a white-lined cup. Deep within the cup are the yellow anthers like grains of gold. This is one of the anemones—the pasque-flower, the real *Easter flower,* as its name indicates. It may have been christened in our own state in the days of the Voyagers. Fortunate indeed are we to find this flower. The long, silky, silvery hairs covering all its parts, are as delightful to the touch as its delicate white, green, and purple are to the sight. The children have various names for this beautiful flower, *Wild Crocus* being one of their favorites. One specimen in our University herbarium was found near Lake Superior as late as July sixteenth, but I have never found the pasque-flower in northern Wisconsin.

Five others of the anemone branch of this family have been reported for Wisconsin, all bearing close resemblance to one another. The Carolina anemone, one of the few fragrant ones, comes nearly as early in the spring as the pasque-flower, but it is not common in our state. The wood-anemone, with its single small blossom, white inside and purplish outside, you can find in great abundance almost everywhere along the borders of woods or under bushes, from April till June. It is a cheerful little flower, delicate enough to wilt in your hands as you gather it, yet reviving when put into water, and holding up its head bravely for several days in the prison of your room. The rue-anemone is its blood-brother, blooming at the same time and in the same places, but it has a little umbel of flowers rising above its circle of delicate compound leaves.

Anemone Pennsylvanica blossoms later but blossoms longer. I have found it from June fifth to late in August, and from eastern Maine to western Dakota. It is a fine large plant, the first naked flower-stem dividing into two, and those sometimes dividing again, each stem after the first one bearing a pair of green leaves, and at its top a single large waxy-white blossom.

The meadow-rue is cousin to the rue-anemone, and blooms about the same time. It is much taller, however, though still very delicate. There is great resemblance between the two. The meadow-rue was a puzzle to me for a long time before I knew its name, until I found that its pollen flowers and its seed flowers are upon different plants. Both kinds of flowers are small and inconspicuous, though they both make a fine feathery top to the plant which is greenish, sometimes with a purplish tinge.

While we are out calling upon the new spring neighbors, let us step into this five-acre clearing where the pines were cut off last year. Oh, the beauty of its carpet! The cold brown earth is nearly covered with patches, large and small, of the most delicate and exquisite shades of white, pink, and blue. It is the Hepatica or liverleaf. Fill your hands and come again. You cannot exhaust this treasure-garden. They, too, are cousins to the anemone, but you will think that you find no leaves upon these flower-stems; you will find a cluster of leaves near the ground where they have lain all winter. They are beautifully cut into three lobes, those I have found in northern Wisconsin being rounded, or obtuse, while those in the southern part of the state were pointed, or acute-lobed. Three small, green, leaf-like parts form a little cup underneath the petals; you will take them to be the calyx, but you will find a piece of the stem between them and the flower, and they prove to be merely green bracts which are really leaves, as much so as those near the ground. Here is a spot where the Hepatica are all the purest white. Here is another where the blossoms are nearly all a deep, deep pink—you could almost call them red—and near by is a spot where the blossoms are as delicate a pink as is the palest tea-rose. The shades of blue vary as much as those of pink, and among them all, white, purple, pink and blue, you do not know which is the most beautiful. A morning among the Hepaticas of our wood-lands in late April is a time to be long remembered.

"About this time" in any part of our state, it is well to glance toward the dark marshy places among the leafless April woods, and along the water-courses through the greening meadows. You shall see the dark places lighting up with spots and splashes of gold, and a broad band of new gold marking each little stream and reaching over into the neighboring meadows. It is the sturdy marsh-marigold, of which Jean Ingelow sings—

> "O brave marsh-mary buds, rich and yellow,
> Give me your money to hold."

We in America do not call them by those appropriate names, we call them Cowslips, and Lowell has justified the name for us in the line—

> "The cowslip startles in meadows green."

How little these big golden things look like the anemone! Yet they are of the same family. They please us by their great mass and profusion. The great shining green leaves are a delight, as well as is the pure gold of the cups. You wonder how anything so clean and fresh can come from that black muck and mire. The beauty of the plant is not its only excuse for being. It is the earliest and one of the best of the "greens." It comes when winter's kept-over vegetables begin to grow tasteless, and before the dandelions, or spinach, or beet-tops are ready. The pleasant hint of bitterness in them gives our appetites just the right fillip. We think, "Better is a dinner of herbs than a stalled ox," leaving both love and hatred out of the quotation.

While we are among the leafless woods we might as well take a look for the delicate goldthread, although I have never found it earlier than the middle of May. The little shining, but not very smooth, leaves consisting of three leaflets, are borne upon long slender stems which grow directly from the underground rootstock. The leaves are much scattered, quite unnoticeable and hard to find. The sweet little white blossom when it comes is also on a long slender stem. Its petals are yellow and formed into little tubes at their ends, but they are so very small that they can scarcely be distinguished from the twenty or more white stamens. You will find this shy plant growing upon a little mossy knoll or rotting log. Bury your fingers down into the moss and soft dirt, and lift up the long-stemmed leaves and blossoms with their underground attachment and you will find the reason for the goldthread's name. The long slender branched rhizomes are indeed threads, and of the brightest gold color. Bite off a piece of this stem. You may not like its clean, sharp bitterness, but the old nurses say that goldthread dried and steeped is the best cure for the baby's cankered mouth.

Still in this early spring-time and blooming on into lâte June and July, you will find in your rambles among the dryer woods and rocky pasture-lands the columbine. You would never for a moment suspect it of belonging to the crowfoot family if you were not introduced to it by its family name. Its leaves are compound and make a delicate foliage not so very different from that of several others of the family. But its blossoms are like no others that we have seen. Each flower is a cluster of five little cornucopias, or horns-of-plenty; these are the petals. They are golden within and scarlet without, with the oval sepals colored like the petals curving out from between them. From the midst of the circle of petals come the numerous long yellow stamens and the five yellow pistils, to add to the richness and beauty. The flowers, on long slender stems, turn themselves upside down as if they would pour the wealth in their golden horns out upon the earth beneath them. And there they dip and sway and swing in the sweet spring air, and it seems as if you could almost hear the

"Tune the wild columbines nod to in June."

They have a treasure in their horns, after all, for at the end of each spur is a little drop of nectar which the children as well as the insects, appreciate. I suspect that is why the children call this flower the honeysuckle. A strange thing it is that when the petals have fallen and the fruit is ready to ripen, the stem straightens, and the five long pods filled with many small seeds stand upright. They tell me that a blue wild columbine grows in the Rocky Mountains. Our state has only the one kind, but that is quite satisfactory. John Burroughs has said, "Our columbine is at all times and in all places one of the most exquisitely beautiful of flowers; yet one spring day, when I saw it growing out of a small seam on the face of a great lichen-covered wall of rock, where no soil or mold was visible,—a jet of foliage and color shooting out of a black line on the face of a perpendicular mountain wall and rising up like a tiny fountain, its drops turning to flame-colored jewels that hung and danced in the air against the gray rocky surface,—its beauty became something magical and audacious."

We are not away from the spring members of this family yet. Along in May and June you will find the beautiful soft blue larkspur, and the other kind with the greenish-white blossom. These, as well as the columbine, have spurred petals. But the larkspur having but two little cornucopias seems to be choice of them and has made a pocket of one of its sepals and cunningly tucked both little horns away in it. If you do not believe that remarkable fact go out next spring and prove it for yourself.

Whom shall we call upon next? What! Not this beautiful climber? Yes, indeed the clematis is down in the books as one of the cousins of the pasque-flower and the marsh-marigold, the meadow-rue and the columbine. In many places this is one of the most common of climbing plants, and always one of the most graceful. No plant adds more to the beauty of our road sides or the borders of our rivers and swamps. It is usually found rambling over the low bushes, piles of rocks, and old fences. How does the plant climb from one support to another and hold itself up? Not by tendrils, not by any part specialized for that purpose, but in the easiest possible way—by twisting the long stem of its pretty three-parted leaf around a twig, or branch, or a projecting point of rock, or even around a part of its own plant-stem. In August every branch is a long spray of bridal-white flowers, starry-eyed, and clustered, and fragrant. These are followed by clusters of the fruit with masses of grayish feathery tails. These appendages to the seeds as they glisten in the autumn sun are quite as beautiful as the flowers. We are almost justified in gathering and bringing them home to keep their ghostly mummies upon the walls of our rooms all winter. Wisconsin has two species of clematis. They differ but little. The edges of the leavlets of our more common kind are quite deeply cut, those of the other less common one are entire, while its blossom is bluish purple.

I have left till the last the largest group of this large family. They are the buttercups, the real crowfoots. The botanical name of the group is *Ranunculus*—which means *a little frog*. It is said that Pliny gave them this name because some of the species grow in water, in regions where frogs abound. From that word the whole family of related plants, the Ranunculaceae took its name. There are eighteen kinds of native buttercups in the United States, and thirteen of them are at home in our state.

We shall find considerable variation even in this closely related group; buttercups growing in water, in mud, in the dryest of soils; the plants an inch tall, two or three feet tall; standing stockily by themselves, or leaning their slender stems upon one another for support; leaves small, leaves large, leaves entire, leaves divided into threads; leaves covering the stems, leaves clustered at the base; leaves gray and leaves of the deepest green; blossoms, from the tiny white cup to the bright yellow one an inch across. Many of them are beautiful—others are only interesting.

Let us hunt out the little froggy ones first. We shall seldom find any part but the little white blossom of the white water-crowfoot above the surface. If we dive down into the water with yonder frog we shall find a slender stem a foot or more long, with its leaves all cut into fine, soft, hair-like segments, making a little bunch an inch or more long at each joint of the stem. The yellow water-crowfoot has much the same habits, but the leaves, oddly cut, often float upon the surface. The blossom is a deep bright yellow and larger than the white ones. The yellow kind comes a little earlier in the season, beginning to blossom in May, while it is nearly a month later before you will find its white brother.

The first year that I was in Wisconsin, I found toward the last of April in open fields near La Crosse many rather low, grayish-green plants with insignificant pale yellow flowers. I was told they were buttercups, and my book confirmed the statement. But what a disappointment they were! There were no cups worth mentioning, and no butter in the cups. Or if that was Wisconsin butter I didn't admire the quality. How could a child find out that you love butter by holding *that* blossom under your chin? The whole thing was absurd. It was six weeks later before I found in Lewis Valley on the edge of a little ravine, the real *butter cups.* They were few, but they were the real thing, and precious. It was two or three years after, that riding along in the cars near Lake Superior I got my first view here in the west of a whole field of buttrecups. That was what I had seen in New England. That was as it should be It was "The Field of the Cloth of Gold," with no need of gilded helmets, blazoned shields, and the gold and jewels of kings to make its glory. And each flower of such buttercups is by itself highly satisfactory; each big cup is gilded, and polished, and varnished, like as no goldsmith on earth could do it. From April to September—

> "The buttercup catches the sun in its chalice,"

and holds there its beams for our delight.

And so ends our visit to the Wisconsin family of the Ranunculaceae.

DISCUSSION.

The President: This subject was freely tendered and finely rendered, and I think it should find a response from some of those ladies who are lovers of flowers.

Mr. W. A. Toole: I would like to add a word of praise and encouragement to that paper. There are so many of our wild flowers that we can make good use of and that are so readily cultivated that we should not lose sight of them. The hepatica is sometimes cultivated, and when the clematis was mentioned I felt, as I listened to the paper that the clematis should have deserved more praise, for the native clematis is almost as beautiful and showy as the Jackmanii. It is cultivated by Judge Kelsey and it is growing in such profusion and has such a wealth of bloom that it makes a sight one would hardly think possible.

Mr. Coe: I was more than interested in this paper, and one little flower spoken of carried me back some years. Speaking of some of those flowers carried me back to a little trip I took two years ago in Colorado where the blue columbine is their state flower. Away up on the mountains, just below the snow line is where we get them in their greatest beauty. The saddest feature of it all is that every tourist and everyone coming near them seem to be determined to exterminate the flower. The soil in which they grow is a very light one, and one can hardly pluck a flower without uprooting the whole plant, and people gathering the flowers do not take any pains to leave the plant, but they pull and pluck them as they come in their way and the day is not distant when that beautiful flower will become extinct. We ought to cultivate this in our gardens. It is one of the most beautiful flowers I have ever seen. They grow up near the mountains and they look like a field of blue.

Mr. Cranefield: I am sure there is not a person present who does not appreciate to the fullest extent the excellent paper read by Miss Dean, and in appreciation of her services in preparing and reading this delightful paper I want to move that Miss Dean be elected an honorary member of the Society.

The motion was numerously seconded and, being put to a vote, prevailed unanimously.

SMALL FRUIT CULTURE IN VILAS COUNTY.

W. H. Adams.

Mr. President, Members of the Horticultural Society, Ladies and Gentlemen present:

I am glad, indeed, to have the privilege of coming before this body of co-workers. It has never been my pleasure before to be able to represent our grand and glorious northern Wisconsin at such a meeting and be able to tell of the great possibilities of small fruit growing there and the culture under which they are grown.

I cannot sav as has been said by some of our eminent writers that I was born with a strawberry in my mouth, but I was born "thank God" on a farm and was taught scientific methods in my youth and have practiced them all my life. In my early youth strawberry culture seemed a fascinating pleasure for me, by applying myself and keeping apace with the times took strawberry culture as my vocation and have been at it for nearly twenty years.

Let us drop the strawberry and its culture for a short time and go back to the small fruit in general. I will speak of the fruit grown in my own vicinity—nearly all on my own farm.

STRAWBERRIES, CURRANTS, BLACKBERRIES, RASPBERRIES, APPLES.

I have about eight hundred and fifty Pomona currant sets that have fruited two years. The fruit was exceedingly beautiful. It is a large red currant and has made many friends by the superior quality of its fruit. Currants are easily grown, the ground should be very rich, the weeds and grass should be kept out by frequent and shallow cultivation. Shallow cultivation is necessary because they are surface rooting plants. Pruning should be done early in the spring and should consist of thinning out the weak and old branches and the heading back of those making a vigorous growth. As soon as the buds start in the spring spray with Bordeaux mixture and Paris Green. Do not spray while in blossom as the bee will be destroyed; they are necessary to fertilize the flowers. In using these formulas in the way I have mentioned we have never been bothered with the currant worm. After fruiting season spray with Bordeaux Mixture from about every ten to fourteen days.

Just a word concerning the blackberry and raspberry. You will please understand that the strawberry culture is my business. I speak of the currant, blackberry, raspberry, and the apple that you gentlemen who live in this rich garden of the south might know of the great possibilities of small fruit in northern Wisconsin. You have many prominent speakers on the blackberry subject who can tell you the culture of blackberries and, perhaps, raspberries, but I assure you that spraying is their main foothold or they have not yet attained the full capacity of the plant's fruiting organism.

We have about three hundred Ancient Briton blackberry sets which yielded abundantly. The large, luscious fruit was a beautiful sight; the bushes were loaded. This is our trial test patch and a very successful one. Time will not permit of me to give full culture of the blackberry or the raspberry, but about the same culture as the currant.

We have also a few Cuthbert raspberries and they, too, can be grown successfully in our northern climate. It is not a very paying business to put out trial test patches and experimenting on different varieties, but there does not seem to be any body willing nor enough interested in the north to go into the business, by our efforts to convice them that it is a paying and safe business, we hope some day to start them in this lovely outside work. We have hopes that Wisconsin will yet be a banner state in the fruit business. Let us hope that more of our young men, who are going to the city seeking employment, will wake up to the fact that there are already too many young men to fill those positions. Instead of this city life, have them take up horticulture and make scientific study of it.

There are thousands of acres of good land (which is termed sand by some of our citizens) that is yet untilled. If these gentlemen will come up where the soil is and examine it they will find very much of it clay loam and very rich in plant foods. While we are on the subject of soil, let us see what it is where our state orchard is now located. In a November number of the Wisconsin Agriculturist was an article on the soil of this particular orchard, written, evidently, by some gentleman who had been misinformed or examined the soil too hastily. I do not wish to criticise the article nor the gentleman who wrote it, but I do not agree with him, as the soil is not sand as he said it was. Those of you who have visited the orchard will find it as you enter the field somewhat gravely, but as you near the back part of the field we find very different soil, soil that has grown, before cleared, a mass of poplar, birch, white pine, a heavy growth of hazel underbrush. Land that has such a growth of vegetation is by no means sand. How many of you ever saw hazelbrush growing on sand? I am sure there is not a man in the house that can say yes. Another very fine thing about this land is that it is underlaid with a thick layer of genuine gumbo clay. I dare say those of you who were instrumental in putting the orchard there were justified in doing so. Early in November, I visited the orchard and found every thing seemingly in very fine shape for winter. The trees were healthy looking and were well cared for, but Mr. President will tell you all this. I have here a list of a few varieties of apples which have done exceedingly well in our vicinity and have borne for the past few years. They are: Duchess of Oldenberg, Transcendent, Whitney.

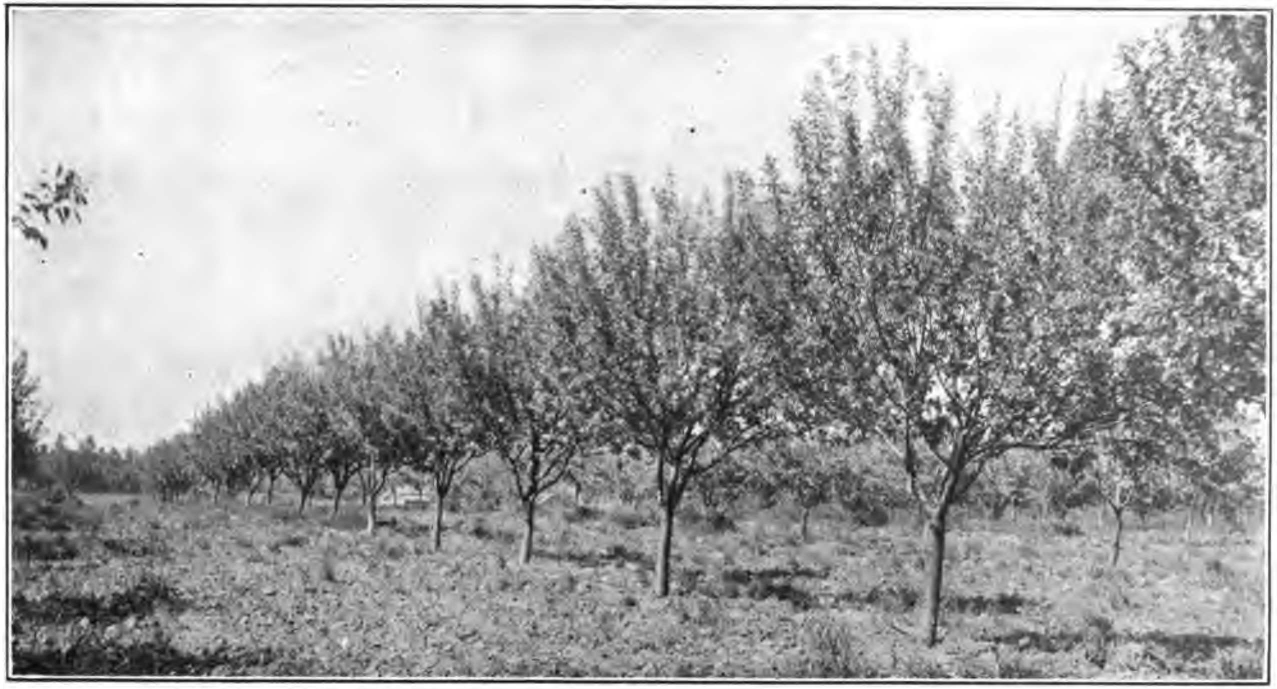
Let us now go back to the strawberry and the culture under which we grow them.

Most people have the idea that money in strawberries comes from broad acres. Nothing is farther from the truth. Profits come from concentration of efforts all along the line. Half the acreage and double the tillage and fertility of the soil should be the aim of every berry grower. Higher grades of fruit are in demand and command higher prices, and this will be intensified in the near future.

Allow me to state my first item of interest for it is this we are all after. Last July, I took to town a load of strawberries and sold them at $2.00 per case, 16 qts. (I received this price for all of them.) At the same time there was on the market berries from the southern part of this state grown by the commercial grower that were up for $.60 and $.75 per case. It is needless to say that the poor, inferior fruit grown by the "let her rip man" under the "let her rip system" of culture could not be sold, as a result, the merchant who tried to handle them lost. After our berries had begun to ripen fast enough so that I was able to supply my customers, they would not even try to sell them at all. Does this not verify my statement?

What I mean by the "let her rip system" is that the little strawberry which is doing its utmost to make you rich and happy is being sadly neglected. Many growers set their plants 4x18

PARTIAL VIEW OF POPLAR ORCHARD, OCTOBER, 1904.



NORTHWESTERN GREENING, WAUSAU ORCHARD, 1904.

or 2 feet. (4 ft. by 18 in. to 2 ft.) They are allowed to run, forming many plants on each runner; if the top of the ground is dry they will not root but feed on the resources of the mother plant. Strawberries grown in this way cannot be properly cultivated, and hoeing is very expensive work. If the land is poor and lacks nitrogen the plants do not mat so thickly, but if the ground is rich the plants will mat so thickly that the sunlight will be excluded from the crowns as a result the berries will be small, many too small to pick, many of them will rot on the vines, thus a loss to the grower. Any of you who are guilty of growing strawberries under these hit and miss methods of culture will soon see that you must spray and take proper care of your plants or in a few years your berries will be outclassed and you will be the looser. Let this be your motto *"Spray or Surrender."*

There are three essential things that must be kept constantly in view,viz.: First, the soil and its preparation. We lay particular emphasis on this. Second, planting; third, proper cultivation and care.

The ideal soil for the strawberry is a deep, loamy soil and one retentive of moisture, having elevation enough to aid in the prevention of the late spring frosts. Hard brick clay or sandy soil are bad.

Let me strongly advocate the theory of late fall plowing, this disturbs the larvae of the May beetle and all other insects that may have found lodgement. Then manure heavily in the fall after plowing that the juices may leach in and become incorporated with the soils as much as possible. In the spring, we plow again, then we use the disc, going over the field several times; do not be afraid that you will disc too much, the more the soil is stirred the better. Then use a floater loaded heavily with stone; this is used to firm the soil. Now take the fine tooth harrow and go over the soil setting it very shallow, just enough to break the upper surface of the soil to prevent capillarity. The land is now in proper shape for transplanting.

Planting: There are several different methods advocated by the berry growers throughout the United States. I am a strong advocate of the Hedge Row system. Setting the rows alternately a row of pistilates then one of bi-sexual and so on, thus allowing plants to be properly fertilized. I know of no better way than to mark the rows 30x30 in., this will permit the cultivator to be run both ways until the runners start.

There seems to be more difficulty in transplanting than any other feature of the strawberry culture. Formerly we have used the hand potato planter to make the holes with. There are three of us and it makes it very easy at planting time. Two to make the holes and set, and one to dig the plants. Too many plants should not be dug at one time; we dig about fifty plants each. We cover each basket with a newspaper, a store paper, or a wet cloth is good, anything to keep the hot sun from wilting the plants. We spread the roots out carefully, setting the plants as near as possible the same depth they were in the propagating bed. Too much stress cannot be laid on the firming of the soil about the roots. There may be ways more convenient than those I have related, but anything that will lessen the care taken in the firming of the soil about the roots, and care in setting, is totally wrong and should be discontinued *at once.* Every night after setting we run the Plannet Jr. cultivater through the day's setting, breaking the packed surface and starting the plants to growing as soon as they are out.

Cultivation and care: After our fields are set, which should be done as soon as the soil can be tilled, we are ready for the spray and cultivator. This should be done immediately after the plants are set. Spray with Bordeaux Mixture at from ten to fourteen days all through the season. There can be no fixed rules for cultivating or hoeing. Always cultivate after every rain to form an earth mulch preventing capillary attraction from drawing the water from the soil. It is well to cultivate every week and hoe as often as you think it necessary, say twice a month; most of the hoeing should be done in the early season.

Everybody should grow their own plants; have a propagating bed of your own. Set them about four feet by three feet. In setting a propagating bed, we select plants from those showing the most vigorous growth the previous year and those having the most crowns. Never grow more than sixteen plants from each mother plant if you want the best results. Never grow more than two plants on each runner and keep them spread out as much as possible, giving them plenty of sunlight. Spray them every ten days during the growing season. The plants of our last year's setting were grown under these methods; at the end of the season they had as high as 13 and even 15 crowns. Propagating beds grown this way cannot be sold at a very low margin, but those of you who want to grow nice plants for your own use can do it at a profit.

Picking the blossoms is of the utmost importance. The blossoms must be removed from the spring set fields, otherwise it will retard the growth, and will lessen the fruit crop the coming year. We go over our fields every morning and pinch the buds before they burst.

Training the runners: By the time runners start in the north the plants are well established, we can then commence training and hoeing. The plants are set 30x30, this permits us to have four plants from each mother plant having two on each side making four plants between each two mother rows. When training, place the nodes in the ground or lay a lump of dirt on them, anything that will hold them in place until they can take root. After the fields are established, keep off all runners.

The object of the Hedge Row is to give all the plants in the row plenty of sunlight. It is less work also in training, hoeing, cultivating, spraying, and in fact it requires a great deal less labor. Heretofore we have grown them with two lines of plants, all plants being set eight inches apart. Upon testing the Hedge Row in a small way, side by side with the double row, we find that the Hedge Row grew finer, larger and berries that were more firm; this was proof enough to convince me that the Hedge Row is the 20th century strawberry culture.

In the fall we mulch; wild hay being handy, we are in this way greatly favored. In the spring when we are ready to remove the mulch, two of us take forks, go ahead and rake the mulch from the center of the rows. We are followed by Plannet Jr. cultivator, giving the upper surface a shallow cultivation; as soon as this is accomplished we then remove the mulch from the rows, care being taken not to remove all of it, enough is left on the rows to prevent the sanding of the berries and not too much so that it will be impossible for the plants to push through. As soon as the plants start, spray with Bordeaux Mixture and Paris Green.

We never grow our fields more than two years because we do not think it pays.

Immediately after berry season we mow and burn the fields. Then comes the hoeing and cultivating. The very day the plants shoot their tender little leaves up, spray with Bordeaux Mixture, and from them on about every ten days during the remainder of the growing season.

I will not undertake to explain to you the fruit grown under these methods of culture. I will refer you to Mr. Cranefield who visited us at our farm during fruiting season, also Mr. Parson who conducted the fruit exhibit at the World's Fair. We shipped several cases there during the latter part of the fruiting season, until August 1st. I think this the best reference I can give you to prove my statements concerning the size, color, flavor, and firmness of the berries, which are grown strictly under these methods.

I have here a list of varieties of berries that have done exceedingly well with us, with exception of one variety. They are: Pistilate, Warfield, Kansas, Sample, Bi-sexual, Nick Ohmer, Lovette, Jessie, Aroma, Brandywine, last but not least, the Senator Dunlap.

The Brandywine is the only one I cannot recommend, it persists in rusting and it is almost impossible to prevent it.

One word in conclusion, that is we all must come to these methods of culture and work for improvement if we wish to be successful 20th century berry growers.

DISCUSSION.

The President: This is one of the best papers we ever had on strawberry culture. I think this paper ought to call out a very profitable discussion.

Mr. C. F. Hale (Mich.): With me the strawberry pays as well as other fruit. He talked so much about spraying, I would like to know what you spray for.

Mr. Adams: In the northwest we spray for fungus principally. We have not been troubled with fungus to amount to anything, but we have had the leaf roller, but that didn't amount to much, but I have looked very carefully for fungus diseases. Our country seems to be adapted to that class of troubles on account of so much heavy fog.

Mr. Hale: What is the nature of the fungus?

Mr. Adams: It starts on the leaf, generally as a little white spot, then it spreads and assumes a somewhat bluish color and then the leaf turns red, we see little red spots on the leaf, that is what we call shot hole fungus.

Mr. H. B. Hotchkiss: How often do you spray?

Mr. Adams: We spray every ten days during the remainder of the growing season, because that is the worst time of the year for fungous growth. We are not troubled so much at other times.

Mr. Hale: Are you troubled with the leaf roller?

Mr. Adams: No, sir. I think if we spray early in the spring as soon as we remove the mulch with Paris Green and Bordeaux Mixture we will have no trouble.

Mr. Hale: What is your object in cultivating after removing the mulch?

Mr. Adams: I believe in intensive methods in cultivation. The ground packs down hard during the winter by snows and rains and the melting snow, and if you run your cultivator through the rows it will loosen the soil and keep the water from running off, and then if you rake your mulch to the edge you will find it is a great improvement.

Mr. Delbert Utter: What is the nature of the soil?

Mr. Adams: We have three classes of soil. The best class of soil we have is something like that (indicating the specimen of Poplar orchard soil) but not so hard; it is a gumbo clay, but it has a foot or eighteen inches of mellow soil on top. That soil is very retentive of moisture.

Mr. Hale: I would like to know whether anyone practices that cultivation after removing the mulch. I had been thinking of doing it. Do you remove the mulch or pile it in the row?

Mr. Adams: We remove it directly over the row. We mulch quite heavily, but not to such an extent that there is danger of killing out the plants. We have a great deal of snow, and the plants do very well till April or the first part of May, then when it begins to thaw in the spring is when we have the most trouble, but by keeping on this mulch in the spring is a great benefit.

Mr. A. V. Schermerhorn (Ill.): How do you keep the dirt from your berries?

Mr. Adams: We keep the mulch on. We take some of it off but don't remove it all.

Mr. Schermerhorn: How long do you carry on that cultivation?

Mr. Adams: Sometimes we cultivate twice in the spring. When the snow goes off early and ground becomes dry we cultivate more than we would ordinarily.

Mr. Schermerhorn: That is the time. You don't cultivate while they are in bloom?

Mr. Adams: Oh, never.

Mr. Utter: You remove the mulch?

Mr. Adams: Yes, sir, just as I have stated.

The President: You don't disturb the plants while in bloom?

Mr. Adams: No, sir, the least disturbance of the blossom will injure the berries.

Mr. Hale: I was delighted with the paper Mr. Adams read and with his method of the Hedge Row. We practice the Hedge Row system on a small scale. My wife was a horticulturist before I saw her and she is as much interested in this work as I am. We practice the Hedge Row system, but we are ridiculed by a great many growers.

The President: What do you call a Hedge Row system?

Mr. Hale: The system this gentleman explained here. We aim to make a diagonal hedge row so that the plants are not more than six inches apart in the row. We grow a small acreage and set about 12,000 plants per acre, and they net us an income of ten cents a plant.

Mr. Schermerhorn: We have a hedge row about eight inches wide, and that is what we call a Hedge Row in southern Illinois. The most successful growers have adopted that system of growing strawberries.

Mr. Sam Running: There is a difference in plants. Some become too big, still we can keep them to a single stool.

Mr. Hale: If they are carefully taken care of from the first and properly selected and restricted there will be no trouble in having them grow too thick.

Mr. Running: Do you think there is something in the variety?

Mr. Adams: No, sir, I don't think so. The one exception may be the Senator Dunlap which is a wonderfully heavy plant producer.

Mr. Utter: Don't you find the Warfield has as many crowns and a bigger leaf?

Mr. Adams: No, I don't think so. We had plants growing of the Senator Dunlap with fifteen well developed crowns and you could not cover the plant with a half bushel basket. When you have a plant that develops that way and so it can receive the full force of the sunshine, and the leaf looks as though it were of a bluish tinge, you can make up your mind you are going to get large and good fruit.

Mr. Utter: What yield did you get?

Mr. Adams: It amounted to about sixteen thousand quarts an acre. There was a little rust patch in one row or we would have had a larger yield.

Mr. J. E. Harmon: Don't you think a big crowned plant freezes out much easier in winter?

Mr. Adams: I don't see how.

Mr. Harmon: I have often found that the biggest crowned plants freeze out.

Mr. Adams: I have never had such an experience.

Mr. Utter: Has not cultivation more to do with successful growing than the selection of plants?

Mr. Adams: I don't know, I don't think so. I think the careful selection of plants has a great deal to do with it.

Mr. Utter: The editor of the Rural New Yorker sent out inquiries to the best growers in the country regarding their views upon pedigreed plants, and it was the concensus of opinion that there was not much value in high bred plants, that there was not enough difference to make it worth mentioning. That is contrary to my belief, but that was the result of careful experiment.

The President: How many replies were received?

Mr. Utter: I don't remember. The replies were all from reliable sources and were published in the paper.

Mr. C. L. Richardson: I would like to ask Mr. Adams why if there is so much in selection and restriction, why it is that a plant that is a new seedling, that has just come out and been put on the market for sale a year or two, and has not been restricted or selected, why will it produce as much and as good fruit as that which has been on the market for fifteen or twenty years?

Mr. Adams: I never had much to do with new varieties, but, of course, we always presume when a variety is new that it is always stronger in its fruiting capacity than an older plant. The Senator Dunlap is apparently a new berry, but is a prolific plant maker, and if it is not carefully restricted and selected it will not amount to anything in two or three years. I do believe if left to run at its own will—I don't know how far it would go, but I believe it would make a row eight to ten feet wide.

Mr. A. V. Schermerhorn (Ill.): I live in the country where the Warfield was introduced and also the Senator Dunlap, and I am very sure and positive that both the Senator Dunlap and the Warfield would not be what they are today if they had not been carefully selected, and I am sure there is something in the selection of plants. I know the Senator Dunlap is a much better berry than it was some years ago. I think it is so with the Warfield, but I know it was greatly improved four, five or six years after introduction. I was on the ground and saw the first berries that grew there. The Warfield originated within fifteen miles of my farm.

Mr. H. G. Street (Ill.): What do you do to keep the plants down?

Mr. Adams: The plants are set in our propogating beds, and last year we selected those that had the most crowns and looked the strongest, because we knew they were high in the fruiting organism. We kept the runners cut and used scissors with which to do that work. We never allowed a runner plant to form leaves and strike root, and we never allowed laterals to form on our plants.

Mr. Utter: How many acres do you grow?

Mr. Adams: This year we had one and one-quarter acres, and next year we will have three acres. We have two and one-quarter acres in other fruits.

Mr. Utter: What do you consider it costs you to grow an acre up to the time of gathering the crop?

Mr. Adams: Well, now, I must confess that is a matter that I have been careless about. I have never kept any account of that feature. A man that follows out this method does not follow such a matter very closely.

Mr. Hale: His work does not count, not if he makes a success of his undertaking.

Mr. C. A. Hatch: Did you ever use dust spray?

Mr. Adams: No, sir.

Mr. Hatch: Why not?

Mr. Adams: For the reason that the liquid spray has always done the work well enough.

Mr. Hatch: I am going to speak about a little occurrence that happened in our country in the way of spraying. One ot my neighbors, a Norwegian, did not know what land plaster was, and another neighbor told him to use land plaster and Paris Green to spray his potatoes with. He went to town to get his land plaster and the fellow he was getting it of supposed he wanted cement, and gave it to him, while the farmer supposed he was getting land plaster. He took it home, mixed his cement with his Paris Green, went out in the morning and sprinkled it on his potatoes, and one application served for the whole season, while just across the road his neighbor sprayed continually during the season and yet the bugs ate his potatoes. The next year the neighbor across the road used the same preparation, and he used it but once, and his potatoes were not covered with bugs any more.

Mr. A. V. Schermerhorn: It is the biggest humbug (i. e. dust spraying) you ever heard of. It has been so proven. The people of Missouri have pretty nearly been spraying continuously, and I want to give you the record of their experience, and that is that it is an absolute failure as a fungicide; for insects it is a partial success. The Experiment Station in Illinois has also thoroughly tested it and is still carrying on the test because many peaple waste their time trying to control fungous diseases with it. It is an absolute failure and money spent on a machine is simply thrown away. (Applause.)

Mr. Hatch: This man I spoke of did not use a machine, he used a can.

Mr. Schermerhorn: Well, all he was after was the insects and for that purpose what he did answered very well, but I want to tell you, gentlemen, Bordeaux Mixture is the only effective remedy against fungous diseases.

The President: We are giving a good deal of time to this subject. We have got two more strawberry papers, but we have a strawberry crowd here and I propose to let this discussion go on as long as it is interesting. I want to ask Mr. Hale to come up here and make his speech and tell us his little story. He is a crank on spraying, he sprays every ten days.

Mr. C. F. Hale (Mich.): I did not hear all the discussion. I heard Mr. Schermerhorn make his speech on dust spraying and say that it is all a humbug, and I want to say to all that, Amen! In Michigan we do not spray every morning before breakfast, but we would do it if it was necessary. I don't know what you spray for, but I anticipate it is for rust. There are some varieties very susceptible to rust, but it can be controlled, and I am here to say that liquid spray is the only thing that will do it. In some parts of the state they do spray their strawberries very thoroughly. I have never sprayed mine but once, for the simple reason I have had no cause to spray them, but perhaps I will have to come to it yet, because I understand this is a preventative and not a cure. I had a few years ago several varieties that rusted very badly, but there were other varieties that did not rust, so I discarded those varieties that were subject to rust. It is a business proposition and if your plants have that disease it is the only way you can get around it; you con do it by spraying thoroughly. I am not in touch with the discussion and I think I had better not say any more on the subject at the present time.

STRAWBERRY EXPERIENCES IN 1904.

C. L. Richardson.

The past season has witnessed an unusual heavy crop of strawberries throughout our section, when it is taken into consideration that the stand of plants was considerably below the average. Neither spring frosts nor blight occasioned much damage this season. Owing to the late spring and cold, wet weather the crop was generally late, although there were considerable differences in the time of ripening of beds which were only a few miles apart. Beds planted on cold, heavy clay were, in many cases, failures, while warm, sandy fields generally produced a heavy crop. The early berries paid the best price, but there was little profit for anyone, prices ranging lower than for any year since 1899.

The season was a little longer than usual, extending from June 15 to July 27,—forty-three days. The first picking was June 18th,—the latest in nine years,—Cameron's Early, Michel's Early, Johnson's Haverland, and Excelsior. Cameron's was about twenty-four hours ahead of anything else and suffered the least damage from frost. The berry is roundish, very sweet, ridged, pink, soon runs small, fairly productive, mats too thickly, dries out quickly, will never become a leader. Excelsior is easily the best early variety we have ever tried and the only one that we should class as productive. Johnson's Early does equally well on heavy clay soil, otherwise, it is not a success. August Luther is earlier than either of these but not so heavy a cropper. Palmer's Early is a small plant, small berry, shows no great promise. Springdale Beauty looks suspiciously like Senator Dunlap. I suspect that our plants are not true to name. Superior is a small bushy plant, which made a good many weak runners; berry, small and unattractive; mildewed and most of them died.

By the 21st of June the rush of the season was upon us. The Haverland, Standard, Bederwood, Dunlap and Warfield produced the bulk of the mid-season crop. The season was favorable to the Warfield and Dunlap but too wet for the Bederwood and Haverland; nevertheless, the Haverland produced the heaviest crop on our grounds, and is, probably, the most productive berry in existence today. Heavy rains made picking very difficult this year, causing the loss of considerable fruit. Some of the time we literally had to pick "between showers." At such times, boys are better pickers than girls as they can pick when it is too wet for girls to work. Throughout our section the Warfield is deteriorating so seriously that many have discarded it.

As the season wore away the medium and late varieties came into bearing. Of these, the best were Marshall, Bubach, Sample, Aroma, Glen Mary, and Marie.

The late varieties are not all that could be desired. Most of them produce large berries but not enough of them. Howell's blasts and winter kills; Michigan seems to lack vigor; Klondike is late and productive but bad color, very soft and rots on the vines. Improved Parker Earle will thrive only on very heavy, moist, rich land. Joe is aggressively healthy; large, rough berry; promising. Ridgway, commonly considered medium, has been very late for four years. The berry is large, round but soft and the plant often winter kills. Uncle Jim looks like a very large, late New York, both in plant and berry. The Hunn, Rough Rider, Midnight, and Nettie seem to be the latest, but the Hunn is poor in color, rusts badly and is utterly unreliable.

Twilight, Gladstone, Staples, Livingstone, Patrick, Cobden Queen, Wolverton, Howell's Klondike, Sharpless, Lester Lovett, Seaford, and Carrie we shall discard.

Hero, Jerry Rusk, Gibson, Wm. Belt, New York, Pride of Cumberland, Nick Ohmer, Uncle Jim, Rough Rider and Sutherland require a heavier soil (many preferring clay) more manure, and higher culture than we have found practicable in extensive field culture. They are better adapted to the fancy trade of a market gardener or the fastidious customer of a specialist rather than to the average commercial grower. Jerry Rusk is the fanciest berry on our grounds. Kansas is productive, a good canner, but looks inferior and dingy in the crate.

The following promising varieties require further trial; Nichols Granville, Lady Thompson, Earliest, Springdale Beauty, Lady Garrison.

Just one rank below the best, we recommend the following, some of which will, probably, under different environment, prove to be among the best grown. Parson's Beauty, Monitor, Pocomoke, Tennessee Prolific, Crescent, Hall's Favorite, Clyde, Brandywine, Splendid.

An impression seems to prevail that as the Marshall is very large and fancy it must, therefore, be unproductive and difficult to raise. Now, this is a mistake. It is difficult to transplant the Marshall; we always loose many of them; but it is a prolific runner, amply repays high culture and produces a heavy crop of very large ridged berries of high quality and remarkable firmness. As a canner it is unsurpassed. We find that it will keep longer and ship farther than any other berry we carry.

Among the comparatively recent introductions, the following have made a particularly fine showing,—*Parson's Beauty,* little known in Wisconsin; sturdy a moderate runner; berries very large, angular, dark, solid. It will produce as many quarts on a given area as any staminate we have.

Miller, made a well-spaced row three feet wide, promised an uncommon crop but mildewed, went to "buttons" and did not do as well as expected. Still, it was fairly productive and appears promising.

The Marie is our most valuable acquisition since the Dunlap. Plant, large, deep-rooted, good runner, behaves very much like the Haverland. Berries, large to very large, round, fairly smooth, uniform in size and shape; color, scarlet, turning to crimson; firm, light weight, an excellent shipper, enormously productive. Quality only fair and many die in transplanting; a purely commercial berry; medium to late.

Lyon resembles the Warfield and Dunlap. Plant and berry a little larger and longer; makes fewer runners; one week later and equally firm as a shipper. Ought to be one of the greatest canners on the market. One of our most productive sorts.

Kittie Rice or Downing's Bride is large, dark, of very high quality, beautiful in appearance. The root is small, plant is attacked by mildew and seems to winter kill in Northern Wisconsin. We recommend it, however.

Nettie is very late; plant resembles Gaudy, but has better roots; berry looks like Hunn, has the same peculiar yellowish tinge.

Midnight is very vigorous; did not lose a plant out of one hundred and fifteen; made one of the best rows we have. Fruited only on new setting. The berry is light, not very firm, smooth, sweet, average quality. Plant tried to blossom over two months; had to clip them six times. Such vigor of plant and determination to fruit ought to make a successful combination.

While the *Climax* on our grounds has failed to produce plants eighteen inches high or to manifest any intentions of producing twenty-five thousand quarts per acre, it has shown itself to be a rampant grower, resembling Johnson's Early, and possesses strong fruiting tendencies. Season, early to late. Berry, medium, dark red, bluntly conical, ought to be a good commercial berry.

Another year has passed over our heads; there have been reports of a new variety combining the plant perfection of the Sample, the Haverland's productiveness, the size and firmness of the Aroma and the color of the Dunlap. We, likewise, have heard rumors of a fall cropper and an everbearing strawberry; but these rumors and these reports have failed to materialize. The Old Enhance still seems to be the nearest to a double cropper of all, unless the preliminary report of a Michigan firm upon the Pan-American be the signal so long desired. They say: "The Pan-American is an ever-bearer and the only one we ever had deserving the name." Whether this be a success or not remains to be seen but it would seem that by scientific selection it would be possible, in the course of years, to make the Enhance produce a considerable crop in the fall.

As yet, none of the so-called extra early and very late varieties are a complete success; this year, under date of July 27th, I find this note: "Still have all the berries we can use. Marshall, Bederwood, Standard, Glen May, Haverland." Other years it is the same. In 1902, the Crescent was the first to ripen with the Haverland a close second. In 1901, the Warfield was one of the last to go. Other years, and other fields than ours bear out these results, until, at times, it seems that the "extra earlies" and "extra lates" exist only in the fevered imagination of the professional nurseryman.

Another year has added its testimony to the effect that the full-matted row should be displaced in the interests of progress by the hedge-row. Under the latter method of culture, each plant is allowed air, sunlight and room for root pasture. Anomalous as it may seem, it is the rampant-running varieties which profit most by this method of culture. The means by which the hedging process is accomplished is immaterial; the result only is important. One very successful grower drags his field with an ordinary drag, just before the blossoms open, destroying a great number of plants. Another mulched his rows so heavily that many of the plants never came to light, but those that did come were very large, healthy, and produced an immense crop of fancy berries, while there was no grass and not a weed to be seen. Had the season been dry, the result would have been still more marked as that field would not have suffered from drouth. We obtained our finest fruit from a portion of our field that was hoed after the first fruit had set, and that was then heavily mulched. There is a distinct saving of vitality to your plants in growing large rather than small berries. A quart of small berries contains many more seeds than a quart of large ones. Now, it is the seeds and not the pulp that draw upon the strength of the plant, so that the *number* rather than the *size* of the berries is the real index of plant exhaustion.

The leaf roller has appeared in considerable numbers the past season. Its distribution has been far from uniform; many sections seem almost free from its depredations, while others have been so seriously infected as to cause considerable damage to the crop. In view of the fact that this is, to-day, the most destructive enemy of the strawberry a better understanding of its life history and habits is very desirable. These facts are not as yet very definitely known. The manner in which it passes the winter is not absolutely determined, and, yet, the ability to prevent its dispersion by the shipment of plants from one part of the country to another depends largely on the solution of this question. Its susceptibility to poisons has not been accurately worked out, nor the distance to which the adult moth will fly in search of a new home. Its prevalence is wide-spread. In the last seven years we have received the leaf-roller in six consignments of plants from New England, Maryland, 2; Minnesota and Michigan, 2; and every one of these houses was guaranteed by a complete legal, duly-authenticated certificate of nursery inspection.

The injury done by the insect is all accomplished during the larva stage, when it appears as a small greenish worm, ranging in size from very minute to one-half inch in length. It folds together the leaves of the strawberry, binds them with a silken web and lives inside the case thus formed. The leaf thus attacked turns brown, shrinks up and dies and, consequently, if the leaf-rollers are very numerous the infested field may appear dead and dry, or even look as if scorched by flames.

The egg of the leaf-roller is laid on the under side of the leaf; hatches in from seven to nine days, when the young grub migrates to the open, upper surface of the leaf and feeds along the midrib for from twenty-four to seventy-two hours. At the end of this time it is sufficiently encased to be out of reach of poisons. Inside the rolled leaf, the larva feeds and grows for twenty-eight days; changes to a chrysalis and appears nine or ten days later as a reddish-brown moth, half an inch across the wings, mottled with black and white markings. In two or three days the moth begins to lay eggs, thus completing its life history. In Wisconsin, there are two broods each year,—one in June and another about forty-five days later. Farther south, there are three or even four broods each year.

The Experiment Stations state that spraying with Paris Green, arsenate of lead or some similar poison at intervals of five or six days during the time that the young larvae are hatching is of considerable value. R. M. Kellogg considered this a complete check upon their depredations, while, on the other hand, the latest bulletin of Missouri reports spraying to be "of no practical value." Personally, I consider that if the field to be treated is not too large nor too badly infected, the best method is to go over it, perhaps, once a week from the time the first rolled leaves appear until the runners become numerous, with a pail containing a little water. Pick off all rolled leaves and put in the pail and then boil the water. It is agreed that the most efficient method of restriction is to mow and burn the old field. The fire destroys a very large proportion of the pests in both the larva and pupa stages and by burning when none of the adult moths are to be seen, the field may be so thoroughly cleared as to be practically free the following year.

The only means of absolute escape from these pests is to set uninfected plants on clean land. Even then if there are old beds containing leaf-rollers within, perhaps, from one-fourth to one-half a mile, it is possible that the moths will fly from the old to the new beds.

The authorities differ somewhat as to the most important phase of the leaf-roller's life history, and as to the place and state in which it passes the winter. One observer believes that they winter in the ground. Some of the Experiment Stations state that the larvae change to chrysalids in the rolled-up leaves, remain thus during the winter and become adult moths the following spring. Personally, I am inclined to think that this may vary in different sections of the country. It would seem possible, in view of the considerable size of the chrysalid (one-fourth to one-third of an inch in length and pointed oval in outline) to examine a few plants so carefully as to be certain that there were no leaf-rollers upon them and thus start a "propagating bed" for the following year. But this scheme would scarcely be practicable on a large scale. The pest is as yet comparatively rare and harmless in Wisconsin, but in Delaware, Maryland, Missouri, Illinois, and some other sections, it has occasioned the entire and absolute loss of fields, mounting up into the hundreds of acres. Its ravages are usually confined to limited areas and certain seasons, but, even under these limitations, it is dangerous and destructive.

The leaf-roller, like the Colorado potato beetle, apparently has come to stay and in the words of Ex-President Cleveland: "It is a condition, not a theory, that confronts us."

DISCUSSION.

The President: I don't know that he told you the best four varieties. I want him to tell the very best four varieties to plant.

Mr. Richardson: Do you mean in the way of productiveness or for what purpose?

The President: I don't care, for any purpose.

Mr. Richardson: The Excelsior, Haverland, Senator Dunlap, and the question is which one of the later varieties we would take. Perhaps the Glen Mary might be satisfactory.

The President: Name the best two for the commercial grower.

Mr. Richardson: The Senator Dunlap and the Haverland, or rather the Haverland and Senator Dunlap.

The President: If there are any varieties that have escaped I want to make a list of them. (Laughter.)

Mr. C. F. Hale: Did you mention the Sample?

Mr. Richardson: I mentioned it as being one all right foi commercial purposes.

Mr. Sam Running: Did you mention the Clyde?

Mr. Richardson: In some places I would place it among the leaders.

Mr. Running: How would the Roman compare with the Glen Mary?

Mr. Richardson: It is of good quality.

The President: We all like strawberry sauce, but we don't want too much. We will let this strawberry discussion go on for three-fourths of an hour and then we will have some apple sauce.

STRAWBERRY EXPERIENCES, 1904.

W. S. Hager.

In the spring of 1903 set one acre of Warfield in alternate rows with Splendid and Wood. Set plants 36x48 inches on flat loam with heavy red clay subsoil, well fertilized previous season. Previous crop early peas. Cultivated both ways until vines got too long, then cultivated the wide way only using a runner cutter, keeping a clear path of about 24 inches. Thinned plants to about four inches. Covered in November with six tons of oat straw which was moved into path between rows late in the spring. Went through with the hoe and cut out what dandelions, thistles and other weeds could be found. Began picking June 25, finished July 22. Picked about 625 cases or 10,000 quarts. Shipped to Escanaba in the early part of the season and to Milwaukee in the last part, and one-third of the crop went to the local trade. Average price a little better than $1.00 per case.

This year shall keep an accurate account of all labor and expense so that I can tell what the profits are.

In my trial bed shall discard Marguerite and Bubach. Clyde has splendid large healthy foliage and beautiful blossoms but very little fruit. Johnson's Early is a week ahead of anything else in bloom, and only 15 minutes ahead in ripening.

Sparta promises to be a good shipper. Kansas sends out lots of runners, but Haverland I think is the best, in quality, of anything I have. But Splendid is the best by far of anything that I have tried for commercial growing.

DISCUSSION.

The President: This paper is along the same line as that of Mr. Richardson's, and it is one out of which we can get a great deal of good. We have had three strawberry papers and they were all good, but perhaps we may overdo it.

Mr. Geo. J. Kellogg: The hedgerow I consider as a single row and the matted row I consider two rows on either side. There is one thing more I would like to have brought out in the discussion, and that is in regard to these pedigree reports. I wish we had those reports and knew how many men and who they were that wrote those reports. I have been trying a few pedigreed plants to make a success of them. I think the first speaker suggested a good sensible way of getting a good plant, but I have had failures in getting pedigreed plants of old standard varieties. I would like to know if anyone here has seen any benefit.

Mr. C. L. Pearsons: Tell us the best four varieties.

Mr. Hager: Our volume is supposed to go out throughout the state, and we want to advocate some varieties that will be satisfactory to the farmer. Now I have been trying some early kinds that were perhaps fifteen minutes earlier than the Bederwood and Warfield, but those are the best two that I could find if I could have no others.

Mr. Nicolai: Does the Warfield do well on loam soil?

Mr. Hager: Not as well as it used to. I think it has been run to plants too much and has produced so many outside runners that it has lost its vitality.

Mr. Nicolai: I have been trying to grow the Warfield for the past six years, but it has never done as well as the Splendid growing side by side. My soil is very sandy.

Mr. A. F. Hale (Mich.): I don't think the Warfield will do well on any sandy soil alone, except in a wet year, the plant is rather shallow rooted and dries up.

Mr. Hager: The only objection I have to the Warfield, with us anyway, it is such an awful job to keep them thinned out. They make so many runners and if you want to keep them off you have got to get in with the hoe and cut and pull them up. It is a plant with a short root.

Mr. Wm. Hanchett: Mr. Kellogg says the Warfield will run out by running too much to plants. The fault I have to find with it is that it runs too much to berries. It is frequently the case that we have Warfield run to berries to the extent that we pick three to four hundred cases. I want to say a word about pedigreed plants. I think every commercial strawberry grower ought to have a propagating bed. I think he ought to take special pains to protect that bed in the winter. For our purpose on our farm at Sparta we have found a propagating bed to be an excellent thing. We put on a lot of straw and in the spring we have a lot of strong, vigorous plants, pedigreed plants, and sometimes where the straw covering has not been put on so thick we find we have no pedigreed plants, and when we plant them out they will start and grow a little, but when the hot sun comes out they will wilt and it will not be long before the roots are gone. In this strawberry discussion I would like to know the experience of those who have been troubled with root killing. We have called it winter killing; we lay it to the winter sometimes. It seems to me the winter is partially to blame, and sometimes it seems as though it was some disease that attacks the roots, and the disease comes on before the crop is ripe. We hear a great deal of complaint about root killing, and especially of the Warfield. I would like to know whether it is winter killing or whether it is due to some bacterial disease that attacks the roots.

Mr. Geo. J. Kellogg: I think it is due to the winter. Every winter that they were kept dry all winter we would have the same trouble in the spring. We may get it before the snow and moisture come in December. I would not be surprised if the roots were injured this winter. Speaking about pedigreed plants, I received some. Van Deman from Mr. Hanchett and they did not have life enough to produce a single blossom. They were grown as a great many Warfield were grown, and it took me years to get fruit from them, and then I didn't get much fruit.

Mr. Hanchett: I want to tell Mr. Kellogg where they came from. We took particular pains to send some extra large plants. We only had two rows from which we sold extra large plants during the season, and we used to go out and pick two quarts of nice berries from each row. We became very much enthused with the Van Deman strawberry and we set out quite a field of them. They did very well the next year, but since then I don't want any more of them. They have always been a sea of white blossoms with us, but when the petals fell off and an examination was made where the berries ought to have been you would find a little black worm.

Mr. Geo. J. Kellogg: The mystery to me was that the plants did not show a blossom that first year.

Mr. L. C. Richardson: In relation to the question Mr. Hanchett asked, this past year we had sixty-seven varieties, and we did not find that the Warfield had root killed more than any other variety, and I think it is the heavily rooted and the heavily crowned plant that suffers the least from root killing.

Mr. W. S. Hager: Speaking of root killing, two years ago I had a small piece of ground, I think it was about an eighth of an acre, set in rows, one row of Warfield and one of Bederwood, and the Bederwood were very badly injured while the Warfield were absolutely all right. In fact, I thought the Bederwood was gone, but they recovered sufficiently to fertilize the Warfield.

Mr. Richmond: There is an old German living across the river, and I am so near the line that I come in contact with the people across the river a great deal. There are quite a few Germans living there, and I asked this man what was the best variety he could depend on for shipping. He said they depended on the Warfield as the best variety they had, and they ship an immense pile of berries. They are big strawberry men. They have planted several acres and they still grow the Warfield and stick to it.

Mr. H. G. Street (Ill.): We have been studying varieties down there in our country at the Experiment Station, and I have been experimenting on our own grounds, and we have simmered it down to four varieties, the Bederwood, Warfield, Splendid and Senator Dunlap. We have never found the Warfield to go back on us if properly fertilized. I have never heard a complaint that I can remember until I came to this meeting. The Splendid we regard as one of our best berries. It originated in sandy soil, and it was originated by Mr. Shepard, I knew him very well, and we count it as one of our best berries.

Mr. Sam Running: I have been growing strawberries for the last twenty years. I have had as many as one hundred varieties. I have had the Warfield and I find it is a very peculiar berry so far as fertilizing is concerned. Wherever the foliage overlaps so as to cover the blossoms it is difficult to fertilize it, but where the plants are thinned out and are situated so they get the light and air, they will fertilize, that is, providing it is not too wet, if the ground is not too damp so that the dew during the night will cover it and so it will hardly dry off during the day time. It needs light and it needs circulation of air through the foliage in order to secure fertilization.

Mr. A. F. Hale (Mich.): I do not want to take up the time of your meeting, but I have been thinking what a good thing it is that you do not all have the same variety. I have been somewhat interested in hearing the varieties named that you recommend as the best. In Michigan we would not grow them at all, not for the farmer and certainly not commercially. The Warfield is a good berry, we cannot grow it at all. I want to ask Mr. Kellogg a question. I rather infer he does not take much stock in pedigreed plants, is it for the reason that you have not been successful with them or don't you believe in the idea?

Mr. Geo. J. Kellogg: I believe in the idea and I have believed in it for a number of years.

Mr. Hale: I don't believe that those who have carried it in the market believe in the principle.

Mr. Cranefield: I am not a strawberry man or a strawberry "crank," and I wish to say but one word on this subject of pedigreed plants. The question will not be settled at this meeting and I doubt whether it will be settled at any subsequent meeting in the next fifty or one hundred years, because you have touched upon something that harks back further than the history of the strawberry. It has puzzled scientists since the creation, and that is the influence of heredity and environment. We have men who have argued on both sides. Some scientists claim that acquired characteristics cannot be inherited. It is heredity vs. environment, and if it is settled it will be on the basis that both have a decided influence on the history of the plant or animal. I think that no one will deny that heredity has a wide influence, either upon plants or animals, and acquired characteristics may be inherited. Both these factors appear in the breeding of plants. Pedigreed plants will not be a success unless surrounded with proper environment. Plants with an ideal environment may struggle for a time, but unless there is this influence or heredity behind them they will soon be commonplace. These two things must go together in successful plant breeding, both heredity and environment and their influence. Your pedigreed plants are apt to fail unless you place them in the proper environment.

Mr. W. H. Webb: I came from the furthermost point in Wisconsin to hear this discussion on strawberries. My first lesson in strawberry growing I got nine years ago from Mr. Hanchett of Sparta, and I never met him until today. For eight or nine years I have been experimenting in a small way at Superior with several varieties on a heavy clay soil. Having resided in southern Wisconsin for a number of years, I know there are people in southern Wisconsin and northern Illinois who thought they could raise strawberries. We raise strawberries in northern Wisconsin and they are purchasing our strawberries in southern Wisconsin. Most of the varieties that have been named as good yielders we have tried with wonderful success. Your Secretary, Mr. Cranefield, can vouch for some of our success. I have never seen anything that needed spraying either before or after breakfast; we don't know anything about the diseases that have been mentioned. As I say, I have tried quite a number of varieties, having tried from four to six every year, and they have all done excellently. Last year I wrote to R. M. Kellogg for the four best varieties. I got the Senator Dunlap for one, and sometime after that President Loope came up to that country and I tried to get him to look at my strawberries. He asked what kind I had and I told him.

He said the Senator Dunlap is a good one. Our climatic conditions seem to be just right. We have plenty of warmth and moisture and the climate seems to be just adapted to strawberry culture. I have never seen in Wisconsin, Michigan, Illinois or Oregon anything to compare with the strawberries in texture, flavor and size with the strawberries raised in northern Wisconsin. Our season is late, the earliest we have ever commenced picking was on the 4th of July, usually from the 10th to the 15th, and I have had strawberries out of my own garden on the 4th of September.

Mr. Nicolai: What is the average return for strawberries in the northern part of the state?

Mr. Webb: We have not got along that far yet. (Laughter.)

Mr. Nicolai: That is a leading question in our section of the country.

Mr. Webb: Well, I can't tell you in dollars and cents. But I want to tell you one thing; we have a mulatto who came from the south about twenty miles from nowhere and he was recommended to go into the vegetable and strawberry business. He bought another forty, has ten to fifteen acres under cultivation, has built a house and barn, is entirely out of debt and has about a thousand dollars in the bank. This, is his fifth year on the place. He grew mostly strawberries right among the stumps. He told me he had run a little over $1,200 an acre, but he could not give me an exact idea of what his profits were.

The President: There is another item of interest that has come out here in connection with what Mr. Webb has said. He says he has that hard soil that you have heard described here by the Secretary. (The Secretary promptly dropped his sample upon the floor.) When I went there I found the nature of the ground such that I sank into it to my shoe tops. The soil where Mr. Webb is has this peculiar condition and he knows all about those things. I wish he would say something more about that.

Mr. Webb: The soil condition is this: The clay soil is sticky, contains considerable lime, and in case of fall plowing to any depth when it is turned up freezing thoroughly disintegrates it so itbecomes thoroughly pulverized and the action of the winter leaves it in good condition. It will not do to cultivate in the spring. Our greatest trouble has been the impossibility of keeping strawberries in the matted row, and only to a limited degree in the Hedge Row system, for the singular reason that our white clover grows so profusely and so rapidly, that even where it is cultivated up to the very last the white clover comes in again. It grows everywhere throughout the country, in sod and stump, and in the spring it grows up in the matted row so it chokes out everything. That white clover will grow eighteen to twenty inches even where there is no soil. The red clover also grows wild in the woods, among the stumps and everywhere. When it comes to our clay loams it is not so much so.

Rev. Reilley: On one occasion I remember I received a box of berries from Mr. Webb's berry patch that were the most delicious I ever tasted. I want to substantiate what he has said in regard to his berries, because they were the most delicious berries I ever tasted in my life. I wish Mr. Webb could tell us the name of those berries because they were the finest I ever saw.

Mr. Webb: They were the Senator Dunlap.

The President: You can't argue with Mr. Webb, because he has conditions there that are very different from anything the most of you ever saw.

Mr. Irving Smith: There are one or two points I want to emphasize a little that were but slightly touched upon in this discussion. In experimenting with new varieties some said they got new plants, tried them one year and then threw them away. Most of us do not think we can test a variety in one year only, nor in two years, but it must take three or four years, and five years is better, to tell what that variety is going to do on your grounds. You get plants from Michigan, Illinois, Superior, or some other place where the conditions are entirely different from what they are in your own locality, and in only a year's time it will give you no idea of what those plants may do when they are produced on your own place. In the first place, perhaps the soil is very favorable or very unfavorable, or whatever may be the condition, but we must have those plants in more than one condition. If we happen to strike a very favorable season we are apt to be favorably impressed with a variety, but the next season may be just the opposite and we do not know what to say. So I would advise you not to be in a hurry to throw away a new berry because it may not do well the first season, but give it a chance. One more point in regard to which there has been considerable said, and that is concerning the leaf roller and its prevention. We were annoyed considerably some years ago with various insects of that class, until a flock of those ring-necked plovers, commonly called killdeer, put in their appearance. The boys would shoot them and we called them pretty good game. I shot a few of them myself, but after awhile noticed that they liked to run in the strawberry patch better than anywhere else, so I took my knife and opened one of them that was killed in the strawberry patch, and I found that the only discernable thing that the bird had been eating were those same pests that destroyed our strawberries in the shape of worms, caterpillars, and things of that sort, and after that time I absolutely forbade anybody shooting any of those birds. We have had for the past twenty years a flock of those plovers in the strawberry beds. I have seen them so tame where they nested that where a crowd of children would come on a bird they would have to go around it. The boys with the cultivators have to go around the nests, they will not leave them. We have never been bothered with any kind of insects on our strawberries since those birds came there.

Mr. Geo. J. Kellogg: I want to emphasize what Mr. Smith says. That is a very strong point in favor of our experiment station starting a strawberry trial department. I am making these remarks for the benefit of Professor Sandsten; I want him to make an experimental strawberry bed. I am satisfied one year is not long enough to make a trial of any variety of strawberry. When I see a failure of plant, fruit and everything I don't want more than one year to decide on one or more varieties. I say in my paper that strawberries should have a trial of three or four years; I am satisfied of that fact.

Professor Sandsten: Mr. Kellogg has reminded me of the fact that we ought to have a strawberry trial department at the Experiment Station. Several years ago I think my predecessor, Professor Goff, went into an extensive trial of the strawberry, but after those trials we have not tried the strawberry on the place. I talked with Dean Henry and I mentioned the matter to him very plainly, and I also mentioned Mr. Kellogg's name in connection with it, and I will tell Mr. Kellogg that we are going to start in the coming spring. (Applause.) What we will gain by it is hard to tell, and I will allow Mr. Kellogg to speak upon that point. Of course, it is true that different varieties of strawberry plants will not do equally well on all kinds of soil, and experiments of that nature have not been uniformly successful or beneficial. Of course, I cannot tell you that a new strawberry is absolutely worthless. It will come down to the fact that you will have to do this experimenting yourselves, but we can give you some aid and we are willing to do so. We are willing to do this at this time because we are limiting our plum business. We are experimenting on plums in a different line from what we have been, and now we are going to take up strawberries, and I hope Mr. Kellogg will give us some valuable pointers and give us all the aid he can.

Mr. Geo. J. Kellogg: I will give you all the plants you want, and I will give you all the assistance I can.

Mr. Jos. Treleven: What Professor Sandsten says about experimenting is true, because certain things that would be a success at one place would, perhaps, be an entire failure on our black loam soil. I have noticed plants bought of Mr. Kellogg that did well on his soil, but take them on our black soil and they were almost a failure. I think experiments should be carried on in different sections of the state and on different soils.

STRAWBERRIES OF 1904.

By Geo. J. Kellogg, Lake Mills, Wis.

Mr. President, Ladies and Gentlemen:

This subject gets rather monotonous even to a strawberry crank when he is asked to write it up twice a year, and if I repeat, contradict or take back some of the things I have formerly said, it will only show that I am learning something or forgetting some things that were not so.

The season of 1904 was dry and cold until July, then cold and wet until October, we had no summer. Since October, it has been very dry. October only 2.88 inches of rain, November only .09 inches, hardly a trace. The condition of the ground December 1st is nearly as bad off as it was in December, 1898. The months of August, September, October and November of 1898 gave 12.14 inches precipitation, while the same months in 1904 gave 12.94 inches precipitation. I give these figures to show the fearful condition of the ground if we have a dry, cold winter. The first half of December gave us eight inches of snow that lay where it fell and promises to avert any damage we might have suffered by freezing up dry. December 22d and 23d, this all melted. 26th 1½ inches rain and six inches snow on an ice bottom, which promises protection, and continuous snow to February 6th, better yet.

The strawberry crop, besides the drouth had frosts June 9, 10, 11, 12, 16, and 17th. Our first ripe berries were June 7th, first for market, June 15th, last picking, July 13th. The crop was about one-half to two-thirds a fair yield; quality poor, off flavor, owing to lack of sunshine and heat. Only ten days in June the thermometer went to 80° and above. On light soils the berries were better than on clay, and if not too dry the yield was better.

I selected twenty kinds in the early part of 1903, mostly new and the best I could find. I took nine from R. M. Kellogg & Co's. catalogue (Michigan), seven from A. W. Weston & Co, (Michigan), one of F. H. Chappel (Wisconsin), and three new seedlings of J. R. Reasoner, the originator of Dunlap. I prepared the ground well, planted in rows three feet apart, set one-half the plants and kept in single file six inches apart allowing no side runners; the other half I planted in the next row, letting them form three plants wide five inches apart. I then cut off all other runners. After tending them the best I knew how, I only had a little over two bushels to the square rod, measuring paths and all. I do not think the new beds yielded this much, the amount was augmented from the old beds. With the care I gave my new beds this was not half a crop, and I lay much of the failure to the new and worthless varieties.

Of the twenty kinds I retain Aroma, Midnight, and possibly, Velvet; this last seems feeble in growth and does not recover after fruiting. I have left part of Commander, Cameron's Early, Ernie, T. T. Lyon, Lester Lovett (which I believe is Gandy), Marie, Oregon Iron Clad (which I believe is Gladstone), Oom Paul, and Sutherland. I have dug up the last one of Reasoner's three seedlings, Challenge, Dornan, Texas, Uncle Sam, and Woolverton. Reasoner's seedlings were off color and too small. Challenge set very full and grew to more than half size, then all failed, did not mature a berry; while the rows either way held their foliage and matured their crop. I can see no cause for the failure either in treatment, soil or insects. Dornan (Uncle Jim) was badly mixed, a small worthless berry and a few I think were Jessie; this larger berry, I think, must have been what was sent as Dornan. If this Dornan is Jessie, then I have eight varieties all appearing the same as Jessie. I had Woolverton years ago at Janesville, that was a profitable late berry, and I had the Kellogg Co. send me twice of Pedigree plants of this kind, thinking I could make it succeed. I would have kept Texas one year more if it had not been right where I wanted to set Wild Wonder, a new variety costing a dollar a plant; this is promised to run out white clover and June grass, fruit as good quality as the best wild strawberry, solid to the center, size by the case as big as hulled blackwalnuts, and yield double of Warfield. If this is true, I shall want nothing else except a very early berry and a very late one. One thing it promises is true, for it is equal in making plants to the best, as I set my plants May 16th and August 3rd I took up six new plants and from those six I have over two hundred now, and about five hundred from the six plants set May 16th. Besides Wild Wonder I planted Mark Hanna and his wife, last spring. Mrs. Hanna is a fine grower and promising, but he is a puny fellow and probably worthless. J. L. Hartwell, of Illinois, of whom I procured my plants, says of them after fruiting, "that they impress him as not being worth a second trial." He wrote me last June that he discards Tennessee, Prolific, Lloyd, Ernie, Drouth King, Springdale, Climax, Vant, Early Beauty, and two others whose names I cannot make out.

Mr. Hartwell wrote me he had nearly an acre devoted to strawberries in his trial station, and has been so disgusted with the new varieties that he has been tempted to throw up the whole thing. I find the promises of new varieties about as friend Hartwell does, utterly disgusting. I am not discouraged trying but last spring I had but little room. I selected ten of the most promising of the twenty kinds I have mentioned and sent to my boys at Janesville who put them in field culture to see if there was any good in them when not petted too much. My ground may be too rich for I don't consider two bushels to the rod half a crop when I have the record of the old Wilson of five bushels per rod.

Dunlap is making so fine a record all over the country that I have faith in its originator, J. R. Reasoner, and this fall I planted his Nos. 267, 269, 324, and 325 on trial under restrictions and hope they may win.

With all my experience I would advise those who want strawberries, whether the commercial grower, the amateur or the farmer to stick to the kinds that have paid them best for the last five years, buy a few of the new kinds even at a dollar a plant, it will pay if they don't lie; don't believe but very little they say about the new kinds; some of them may be a success on your soil but don't give up Wood, Warfield, Dunlap, Splendid, Enhance, Lovett, Clyde, Bubach, Glen Mary, Brandywine, Gandy, Sample, Haverland, and any thing else that pays. Add to your list, if you have not tried them, Aroma, Midnight, and perhaps, Velvet. I am more and more impressed with the necessity of restricting such rampant growers as Dunlap, Warfield, Crescent, Michel, etc., to narrow rows every where if you would get the best returns.

You will see that I have left out Dornan, Duncan and Oom Paul that I put in my ten list of last winter, page 55, this only proves that we should not recommend or discard any new variety until we have tried it four years; the weather, soil and treatment may prove a success one year and a failure the next. High price of a new kind should not deter us if we can be convinced of its superior merit. Just think of the dollar plant that grew its one hundred in the season, and four years more restricted at the same price. After all, choosing a strawberry is as much a lottery, though not as expensive, as choosing a wife.

ELEMENTARY FACTS CONCERNING FUNGUS DISEASES.

Prof. W. S. Brown.

Spraying has come to be such an important factor in the care of orchards that it seems scarcely necessary to urge its importance upon the farmer. The thing needed more than any other at the present time, perhaps, is for the fruit grower to have a fundamental knowledge of the diseases which he is trying to combat and the best ways of combating them. Nearly all of the so-called rots and decays to which fruits and vegetables are liable are caused by a form of plant life called Fungi.

The true Fungi constitute a group of the cryptogams characterized by lack of chlorophyl. They are very closely related to the slimy fungi which cause crown gall and to the bacteria. As they do not contain chlorophyl they cannot use the sunlight as a source of energy and must depend upon organized material which has been prepared by green plants for their food. Just as the animals must depend upon plants as a source of the highly organized substances which compose their food, so the fungi must obtain their subsistence from living or dead cells of chlorophylous plants.

It would not be fair to this great family of plants to put them all down as harmful or of no use to man, for some of them are of considerable economic importance; for example, the mushroom for food. Again, caterpillars, flies, and other injurious insects which often become so numerous as to seriously threaten crops, are oft-times held in check by an attack of parasitic fungi which feed upon the juices of the insects and cause premature death.

There are two general divisions of fungi, based upon the food which the fungus uses; namely, saprophytic fungi, those living on decayed plants, and parasitic fungi, which subsist upon living hosts; toad-stools on dead trunks of trees and the mold on bread are good examples of the former, while wheat rust and potato blight illustrate the latter.

Intermediate forms capable of passing part of their existence in the shape of either saprophytes or parasites, are numerous. Of the two general classes mentioned, the parasitic fungi are of far the most economic importance.

The parasites are divided again into two general classes; the epiphytes and the endophytes. The former spread their vegetative mycelia over the surface of the host and gain their nourishment by the formation of haustoria, thread-like processes which grow down into the cell walls. The mycelium of the fungus first attaches itself by means of small adhesion disks, and from these disks spring the haustoria. The endophytes send their mycelia into the inner cells of the plant, and there fresh mycelia is developed inside the tissues and nourishment taken from the inner cells. The endophytic fungi are by far the most harmful.

The fungi have two methods of reproduction, the first sexual or by conjugation, and the second by means of spores which are developed by the mature plant. In the first method a round globular mass grows at the end of a thread of mycelium in which is contained a nucleus surrounded by protoplasm. From the side of this mycelium thread arises an organism, the antherid, which also has a nucleus surrounded by protoplasm. As the antherid usually springs from the mycelium just below the globular mass or oosphere, when both oosphere and antherid are mature, the antherid attaches itself by one end to the oosphere and after sending a delicate, straight impregnating tube through the wall of the latter, empties its contents into it, where the nucleus of the antherid joins the nucleus of the oosphere, forming a new nucleus, which is the foundation of a new cell. After a short resting period, this new cell begins to grow and to divide, and shortly the mycelium of a new plant is developed.

The fungi seem to need the sexual reproduction as a sort of rejuvenating process but the principal way of reproducing themselves is by means of spores. The spores are of two kinds, summer spores, which have the power of germinating and scattering disease very soon after maturity, and winter spores, which are better protected and which carry the disease through the unfavorable conditions of winter. The summer spores form on small threads springing from the mycelium, called conidiaphores. They are of many different shapes and sizes but are usually fastened together endwise in the shape of a chain. These minute spore bodies are disseminated by the wind, by insects, and by the feet of birds. The winter spores are somewhat better protected; the asci, rod-like cells which contain the spores, being in bundles surrounded by a thick wall of perithecium. In order that we may have some conception of the magnitude of this spore reproduction, I quote from Special Bulletin 25, Michigan Experiment Station, as follows:

> "Spores are so small and light that they can readily float in the air for some time as an almost invisible dust and may also be carried on the bodies and feet of birds and insects. In some cases they are produced in such enormous numbers as to form a cloud of smoke-like dust when disturbed, as in the powdery masses of corn smut. Some idea of the amazing number of spores produced by such fungus may be gained only by knowing their measurements. Thus a mass of such spores the size of an ordinary match head

could contain about ten million of these microscopic bodies, enough to cover an acre and a half at the rate of one spore to the square inch."

In order to germinate, the spores of the fungi must be surrounded by proper conditions of moisture and warmth. Most of the fungi that trouble us in orchard work are those which love damp, sunless, quiet situations, and if the trees and fruit can be given plenty of air and sunlight the fungi do not have good conditions for germination and hence will not be so numerous. In western New York and in other localities where considerable damage may be done by apple scab, the apple trees are planted a distance of forty feet apart each way to insure plenty of sunlight and a free circulation of the atmosphere.

One word in regard to spray mixtures. Bordeaux Mixture and Ammoniacal Copper Carbonate are usually spoken of as fungicides, but this term is something of a misnomer. They are really not killers of fungi, but preventers of fungi, in most cases, as can readily be seen by studying the habit of the endophytic fungi. With this class of parasites the mycelium is formed in the inner tissues of the plant. There the fungus puts in its bad work, and by reason of its interior position cannot be attacked by any spray mixture. Really these mixtures should be called fungi preventatives, for they act as policemen to destroy the spores, thus preventing the subsequent penetration of the cell wall of the host by the mycelium of the fungus.

In considering the matter of suitable material for a paper of this sort, it seemed to the writer that brief descriptions of some of the most common economic fungus diseases, accompanied by suitable lantern slide illustrations, might be interesting to you as horticulturists. Following out this idea, views have been prepared from various sources in an endeavor to bring more strongly before us the importance of this subject.

As I am to be followed by two men of unquestionable ability and of large experience, who will describe the methods and materials with which these diseases are to be combated, I will confine myself to brief descriptions of a few of the most important fungi and of their modes of attacking the plants upon which they live.

DISEASES OF THE APPLE.

Apple Scab—Venturia pomi (Wint.).—This fungus makes its first appearance in the form of spots on the leaves, causing the foliage to fall when badly affected; also on the stems of young apples, causing great dropping of the fruit in some seasons, but its worst form occurs on mature apples, where it produces dark grey border spots. These spots are most numerous at the blow end of the apple. When badly infested, cracks often appear in the fruit and it becomes one-sided and misshapen. Aside from the damage done directly by this fungus, much trouble is often experienced on account of the soft rots which find these scab spots loop-holes for their attacks.

Bitter Rot—Glomerella rufomaculans (Von Schrank & Spalding).—This disease is most prominent upon the fruit. The infested apples show small brown spots, which rapidly enlarge until the whole fruit is involved. From these decayed spots come the spores, which are pinkish in mass and can be washed by rains onto other fruits. A great deal of damage is often done to apples in storage by this rot. A few infected apples are sufficient to inoculate barrels of healthy specimens.

Black Rot—Sphaeropsis malorum (Berk.).—A fungus which appears usually on nearly matured summer and fall apples, causing the apple first to turn brown, then black, and finally to become badly shrunken. This disease is responsible also for much of the canker on the limbs of apple trees and may do a great amount of damage unless trees are carefully examined for its detection.

Fire Blight or *Twig Blight*—Bacillus amylovarus (De Toni). —During the summer, scores of letters come to the Experiment Station asking about Fire Blight; what its nature is and what measures can be used against it.

Fire Blight is not a fungus disease, as some suppose, but is a bacterial trouble. Consequently its treatment is somewhat outside of the province of this paper, and yet the ravages of the disease are so great and a correct understanding of its nature by the fruit grower so important, I shall speak briefly concerning it in passing. The Blight is a bacterial disease which attacks the woody tissue of young succulent twigs, finally working down into the older growth. Another form of the disease not so common, but fully as harmful when it appears, attacks and blights the blossom. In either case the diseased parts wither and turn brown in color.

In the first form mentioned the infection is thought to start in wounds on the limbs of trees to which bacteria are brought on the feet of birds and of insects. The infection of blossoms is brought about in much the same way by insects. As the bacteria work beneath the bark, it can readily be seen that spraying or external treatment of the branch in any way will do no good. All that is left the farmer is to cut off the shoots six to ten inches below the infection and to burn them, taking care to disinfect his knife with carbolic acid. It has been noticed that the faster the wood growth of a tree, the more apt it is to blight, hence it would seem logical, and experiments go to prove, that any method of preventing luxurious wood growth tends to prevent and check the disease.

Pink Mold or Soft Rot—Cephalothecium roseum (Cda.).—This mold often appears on stored apples, causing a great deal of damage in moist seasons. It usually follows apple scab and gets its start in scabbed spots on the fruit. Heating of apples, caused by leaving the fruit on the ground in large piles, or by barreling, increases the ravages of this disease to a marked extent. In Bulletin 207, Cornell Experiment Station, the authors regard this fungus as saprophytic rather than parasitic, or living on the dead tissue of the scabby and diseased portions of the apple.

PLUM DISEASES.

Black Knot—Plowrightia morbosa (Sacc.).—This disease is one of the most destructive of any to which plums or cherries are subject. It is often mistaken for the work of an insect, because larvae are sometimes found in the knots. They live on the succulent tissues, but are not the cause of the trouble. The first sign of the disease is an olive-colored velvety swelling which occurs on the branches. The peculiar color is caused by the presence of the summer spores of the fungus, which may easily spread from one branch to another. Later the swelling begins to turn black and in this condition passes the winter with its dormant winter spores stored up for scattering in the spring.

Brown Rot—Sclerotinia fructigena (Norton).—This fungus works on a great many fruits, but is most common on the stone fruits. Plums, peaches and cherries are most subject to its attack. Specimens which have been bitten by the curculio or gouger are much more susceptible to attack than are uninjured fruits. The disease manifests itself by the formation of a rapidly enlarging brown spot on the fruit. As the disease progreses the skin of the fruit is ruptured in places and the greyish-colored spores make their appearance. If the fruit is hanging in clusters, other specimens are sure to be affected by contact. The mummy plums may be seen hanging on the trees in winter.

The winter spore form is found on diseased plums fallen to the ground and previously covered by earth. These mummy fruits give rise to a fungus growth resembling somewhat a tiny wine-glass and in the cup of this wine-glass form are found asci, which contain the spores. This disease attacks not only the fruit but also very often the young shoots of trees, sometimes even killing the tree. A good example of this was seen during the past summer on the Experiment Station grounds where a row of young Aitken plum trees was attacked and entirely destroyed by this fungus.

Shot-hole Fungus—Cylindrosporium padi (Karst.).—Several fungus diseases produce shot-hole appearances on the leaves of plants but the above is most common on the leaves of the plum and of the cherry. The fungus attacks the tissue of the leaf and as this tissue becomes dead it separates and falls away from the healthy portion of the leaf surrounding. Sometimes the foliage is so badly affected that it falls prematurely, thus checking wood and bud growth to the detriment of the tree.

DISEASES OF THE RASPBERRY.

The raspberry has three fungus diseases which are of considerable importance to the fruit grower: The Orange Rust, Anthracnose, and Cane Blight.

Of the first we have no illustration and will pass but a few words of comment upon it. In the spring it makes its appearance on the foliage, causing orange colored blisters to appear upon the lower part of the leaf. The effect of this fungus is shown in the reduced vigor and productiveness of the plants attacked.

Anthranose—Gloeosporium venetum (Speg.).—This disease affects the canes first, later appearing on the younger shoots and leaves. The spots on the canes are purple in the beginning but soon change to a greyish-white color. They gradually spread over the canes, forming white blotch-like appearances, and in the second season often cause the wood of the cane to crack and dry out. The spots on the leaves strongly resemble those on the canes but are smaller.

A disease which has come to our notice comparatively recently is Raspberry Cane Blight, a species of Coniothyrium. The fungus attacks the fruiting canes just before the ripening of the fruit, causing the foliage and fruit to wither. The cane becomes very brittle where the disease appears and changes to a lighter color. The spores are formed in minute pustules in the bark and are of a dark brown color. They ooze out upon the surface of the cane and are believed to be the chief means of the dissemination of the disease.

STRAWBERRY DISEASES.

Leaf-spot—Sphaerella fragariae (Sacc.).—The most serious fungus disease of the strawberry. It first appears as a purple spot, gradually changing to a lighter hue in the center with a brownish border. During the summer these spots give rise to tufts of summer spores, which may spread the disease at that season. Badly affected leaves fall to the ground and in time the winter spore-cases (perithecia) make their appearance, containing many asci or spore sacs. In the spring when they are ripe the spores are emptied from these sacs and serve to start the pest anew.

POTATO DISEASES.

I hope I may not be accused of trespassing by the agronomist if I describe two or three of the fungus diseases to which the potato is subject. The importance of this crop to farmers in the state and the widespread devastation which some of these diseases cause in years which are favorable for their development makes the understanding of their forms and methods of attack imperative.

Early Blight—Alternaria solani (Sorauer).—The disease attacks the leaves and stem of the plant about the time the tubers begin to form, causing almost immediate cessation of growth in the potato. The trouble makes its first appearance on the leaves of the plant in dry weather in the form of greyish-brown spots, which soon become brittle. The affection does not work rapidly but may take two or three weeks in which to destroy the foliage. This disease should not be confused with "tip burn," which is caused by hot, dry weather and which shrivels and rolls up the edges of the leaf.

Late Blight—Phytophthora infestans (de Bary).—A rot which makes a sudden appearance on the foliage in black or brownish areas and from the leaves descends the stem to the tuber, causing dark, soft streaks in the potato and emitting a very foul smell. It thrives best in moist warm weather with a daily mean of 72 degrees—74 degrees Fr., perhaps. So quickly does this blight work that often fileds which are seemingly healthy one day look as if scorched by fire the next.

Scab—Oospora scabies (Thaxter).—This is the most common of potato diseases and one of the most easily handled. It results in the roughening and cankering of the skin of the tuber. It may be controlled by treating the seed potatoes with a solution of corrosive sublimate or of formalin.

DISEASES OF THE GRAPE.

Though Wisconsin is not classed as a grape growing state, still, in favorable localities, this fruit can be raised, and its culture should receive more attention from us. Two of the most serious fungus diseases to which the grape is subject are here enumerated.

Black Rot—Guignardii bidwelli (V. & R.).—The disease usually attacks the plant after a warm moist period of weather and does its work upon all parts of the vine except the roots.

Afflicted foliage may easily be told by the appearance of brownish spots of dead tissue. On the fruit the disease appears in a somewhat similar manner, ultimately causing wrinkling and shriveling of the berry.

The summer spores are borne in minute pustules from the mouths of which the spores discharge when the grape is wet. When dry, these spores may be carried by the wind or feet of birds to other parts of the vineyard.

The diseased grapes or leaves give rise to the winter spores, which rest in this form during the cold season.

Downy Mildew—Plasmopara viticola (B. & C.).—Affects all tender parts of the vine and produces brownish spots on the upper side of the leaf, accompanied by whitish patches on the lower side. These patches are caused by the numerous spores which come through the stomata of the leaves. The fruit is affected when only partly grown, as a rule, and has upon it brown spots with greyish patches of the spores. A winter spore is produced also.

This list would not be complete without a word about some of the fungi working upon the wood of our fruit and shade trees. These parasites are often called "wound fungi" because they gain lodgment upon the host through some wound. Sun scald and improper pruning, using trees for hitching posts, etc., cause much unnecessary damage from these wood decays.

Polystictus versicolor, Fr., on pear.

Polyporus borealis on hemlock, spruce and pine.

Polyporus igniarius on broad-leaved trees, as apple, oak, birch, maple, etc.

In conclusion, let me emphasize two things of prime importance to the horticulturist. First, careful observation in orchard and garden, to enable him to see when anything is wrong with his plants and to locate the trouble, and, in the second place, a wider field of reading from books and bulletins published on this subject, in order to recognize the disease, to know its life history and how and when to combat it.

DISCUSSION.

The President: Now if anybody wishes to discuss this paper or to ask questions they can do so.

Mr. H. G. Street (Ill.): I have had considerable trouble with a disease that affects twigs and the stems and leaves, and I have never known what to do for it. They call it anthracnose.

Prof. Brown: I think I had better leave the whole matter of remedies to the two men who are to follow me. If I started in on remedies there would be nothing for them to say. (Laughter.) The treatment for anthracnose consists in cutting out the canes, the old wood and the infected wood. Where raspberries become too badly affected there is no other way except pulling them out. Spraying seems to help them a little, but not to any great extent. The best thing to do is to carefully cut out the canes after the fruiting season is over.

Mr. Cranefield: My agreement with Prof. Brown was that he would leave the discussion of remedies until after Mr. Hale and Mr. Schermerhorn had spoken. He only agreed to handle the subject from the standpoint of the pathology of fungous diseases.

Mr. Underwood (Minn.): I would like to ask Prof. Brown whether he considers this plum pocket something within the tree itself, or whether it is due to some extraneous condition.

Prof. Brown: It is caused by a fungus which attacks the blossom of the plum shortly after the blossom is formed and causes this abortive growth. I call it an abortive growth because the pit is abortive.

Mr. Underwood: Has the condition of the atmosphere anything to do with it?

Prof. Brown: Nothing more than that a wet and moist atmosphere helps the fungous growth, assists in its development. is similar to that of the plum?

Prof. Brown: It is caused by different fungi, but a moist atmosphere is favorable to its development.

The President: Ask him any question in regard to the disease, but the discussion of remedies is coming later.

Mr. W. J. Moyle: Why is it that some are more subject to plum pocket than others?

Prof. Brown: For the same reason that some apples are more subject to scab than others. Some varieties are more susceptible to it than others.

SPRAYING.

C. F. Hale, Shelby, Mich.

I am very glad the professor told you all about those fungous diseases, and I am sure you will remember them, for I cannot repeat them to you. If you have forgotten what he told you you will have to ask Mr. Schermerhorn to repeat those names to you. We every day fruit growers and farmers have not had the time or the education to go into the scientific aspect of this subject. We know this trouble exists, we get theories of remedies and we have to put those theories into practice to find whether they are correct.

This matter of spraying is one of vital importance to the fruit grower. It is one demanding the attention of the fruit growers, not only in this state, but in all the states, more than any other subject at the present time. Nearly every crop we grow we have to combat some disease or insect enemy, yet while this is the truth it is one of the hardest things in the world to convince the fruit grower that we have to prevent those things by proper spraying. Even men who have seen it done year in and year out are skeptical.

I was somewhat surprised to receive an invitation from you to talk about spraying. I was here last year. I thought I told you all I knew then, but I have had a little later experience. I have followed this for sixteen years, and I know something about what I am talking when I say I know that spraying is a grand good thing. Mr. Cranefield, your Secretary, told me he expected me to treat the subject of spraying in a smaller way, that is for the small fruit grower and for small fruits, and not go into the larger or commercial phase of it, but leave that to Mr. Schermerhorn. The thought occurred to me, where am I going to draw the line? He says the small grower is the one who thinks it does not pay to spray. That is true, the small grower may think it does not pay him to prepare himself to go into matters of detail and go to any particular expense in this direction, and he keeps putting it off from year to year and therefore loses his crop. At the same time that applies to the large grower as well as to the small grower. In what I am going to say I am going to divide the matter along this line: I am going to leave the apple business entirely to Mr. Schermerhorn. I am going to speak on the subject of small fruits, plums and cherries. I have written no paper and don't know where I am going to commence or end, and upon those points which I may omit or which I do not make clear to you you can ask questions, and if I cannot answer them Mr. Schermerhorn can. When I came into the hall you were talking about spraying strawberries before breakfast; if you have to spray before breakfast do it. I said I did not think very much of spraying strawberries after the disease has once taken hold. Of course, you can fight it by spraying with Bordeaux mixture, but with all these fungous diseases this spraying is not a cure, it is a preventive. That seems to be the hardest thing to impress upon the minds of the people, that it is not applied for the purpose of curing, but it is applied for the purpose of preventing disease. They can see why, as they think, it should be put on to kill the disease, but they cannot see why it should be put on to keep off the disease. There are some of you who are raising plums in this state, and perhaps you are having the same troubles, to some extent anyway, that we are having in Michigan. As far as the plum is concerned, I spray it thoroughly, and the professor has told you what they have to contend with.

He told you the black knot is the most serious thing they have to contend with, but there is another disease that is far more dangerous and has destroyed more than any other disease, and that is the shot hole fungus. I wish I could give you the scientific name for it, but I can't do it. For this disease we spray our plum trees before they leaf out in the spring, before the buds start. As to the first spraying, and I am going to give it to you just as we use it, and you may get the formula for that first spraying--and while I am speaking about plum trees I may as well include the cherry---we spray both before the leaves start in the spring, and instead of using the regular Bordeaux mixture we are using blue vitriol alone, and take 2 pounds to 50 gallons of water. Certainly the way we use it and the reason why I use it is because it is cheaper and easier to apply and just as effective as the Bordeaux mixture. Some prefer using the Bordeaux because they can see there is something on the tree, others claim that if a hard rain occurs soon after spraying it will wash off and destroy the effects of the spray if you do not put lime in. I have given that point considerable study and thought. I inquired of the department, and Prof. Taft told me he thought the spores were instantly killed as soon as the spraying solution touched them. If that is true, it is not necessary to let it remain on so long. That first spraying for shot hole fungus is very essential. I do not know that you have it in your state yet, but you may have it. Now this is all I have to say in regard to spraying for shot hole fungus.

The next thing in importance to consider is the curculio, and you can spray at the same time you spray for this rot. For that I use Bordeaux mixture, 4 lbs. blue vitriol, 4 lbs. fresh lime and 1/4 lb. Paris green. That, of course, is used only for insects, such as the curculio. Last evening the question was put to me, "Can you kill the plum curculio by spraying?" and I very emphatically answered that it may and can be done. If you had asked me that question even after I had been spraying for a number of years I would have said it could not be done, but I know better now. Some of you may be skeptical along those lines, you may not believe it, but the trouble may be that you are not thorough enough. This second spraying is put on immediately after the blossoms fall. Now my theory is this, that as far as the curculio is concerned, at that time the bud is just starting to grow, and my theory is that the curculio is feeding on that young foliage, and you are more apt to kill it if you spray just at that time.

DISCUSSION.

Mr. Wm. Toole: You say you take 4 lbs of vitriol and 4 lbs. of lime, and how many gallons of water?

Mr. Hale: Fifty gallons of water and 1/4 lb. of Paris green. Now for the curculio I would follow up that spraying at least once a week, if the weather was right, for three weeks, I mean if the weather was right for the curculio to work. You must understand the curculio is a shy little fellow and does not work in cold weather. In cool weather you need not spray so often unless you have rain.

For the plum rot I would follow that spraying when the blossom was half grown. Plum rot is a very serious thing, and I am not prepared to tell you that every year we succeed in destroying the plum rot even by our spraying. Some years it seems as though the weather was just right and it almost seems impossible to prevent more or less of that rot, and it not only kills the plums themselves, but the twigs they are on. If I had plum rot I would give explicit orders that the plums affected should be picked at the same time the others were. I believe if they lie on the ground the spores will stay in the ground till spring.

Mr. Irving Smith: Do you usè the same preparation in spraying for plum rot?

Mr. Hale: Yes, sir.

Mr. Irving Smith: Is it necessary to use tho Paris green afterward?

Mr. Hale: That second crop of curculio comes from the first to the 10th of July and we use the Paris green.

Mr. Street (Ill.): Do you weaken your preparation at any time?

Mr. Hale: I do when the plums are half grown. While I have given you this formula of 4 lbs. of vitriol and 4 lbs. of lime it will do no harm to use an excess of lime, and you will be srue not to have burned foliage. What I said about the plum will apply to the cherry as well, also to the gooseberry and currant for the blight and mildew. As far as the matter of anthracnose is concerned, the professor stated he knew of no other remedy except to cut out the cane. I don't think spraying will do very much for that. I cannot tell you much about that because I have had no trouble.

Mr. W. S. Hager: Is it not better to have the Paris green in solution before adding it to the mixture?

Mr. Hale: I had not said anything about preparing this Bordeaux mixture. I will tell you the way I prepare it, but I do not know whether we agree or not. There is quite a knack in preparing this Bordeaux mixture as well as in applying it. Some people are not particular enough about slacking their lime. The question was asked me if I did not think air slacked lime would do just as well. It will not. You cannot make as nice a solution. You have got to get the very best lime, and you have got to be careful so you don't burn it. I cannot go into detail and tell you just how it is done, but you have got to have a little common sense, and when you see it is burning you ought to know what that means. Many people are in the habit of putting a little water on and slack it and then pour off the water and add it and go to spraying. If you do that you will have trouble. If you want to make a hundred gallons or five hundred gallons you take your lime and slack enough to make a hundred gallons and take water enough to make fifty gallons with your vitriol and lime and then pour the two together and you will find it works nicely. Instead of putting a lot of water on your Paris Green make a paste of it in the first place, and have it dissolved. One man said he put the proper quantity of Paris Green he wished to use in a common quart can and shake it till it is dissolved. You must not put it right in the water.

Mr. Hager: Do you recommend an excessive amount of lime, or do you use an exact amount?

Mr. Hale: No, sir, I use an excess of lime.

Mr. Hager: You can put in too much lime?

Mr. Hale: I would not use ten to twelve pounds.

Mr. D. F. Bingham: Have you had trouble in burning the foliage of plums?

Mr. Hale: I had the same question asked me in Ohio, and it is the first time I have ever had that question asked me about burning the foliage. The majority of them answered they had had no trouble

Mr. Bingham: They are not burned, but they turn immediately afterward a red color, and the tree has the appearance of ripening, but a second crop of leaves comes on and we get good foliage.

Mr. Hale: I never had that experience. I have one plum orchard and a gooseberry patch, and I prepare the same mixture and put on the same strength and never had any trouble. We use this same strength on the peach trees and it does not seem to affect the foliage in any way whatever.

Mr. W. M. Toole: I have watched plum blossoms closely, and I have seen them as though the frost had taken them, and I have wondered whether it would not be desirable to spray just before the opening of the blossom.

Mr. Hale: It certainly would be a good idea, just as the pink began to show.

Mr. S. H. Marshall: I find that the American plum can be successfully sprayed for rot only at the time when in blossom. If you wait until they begin to fall you will find you are too late.

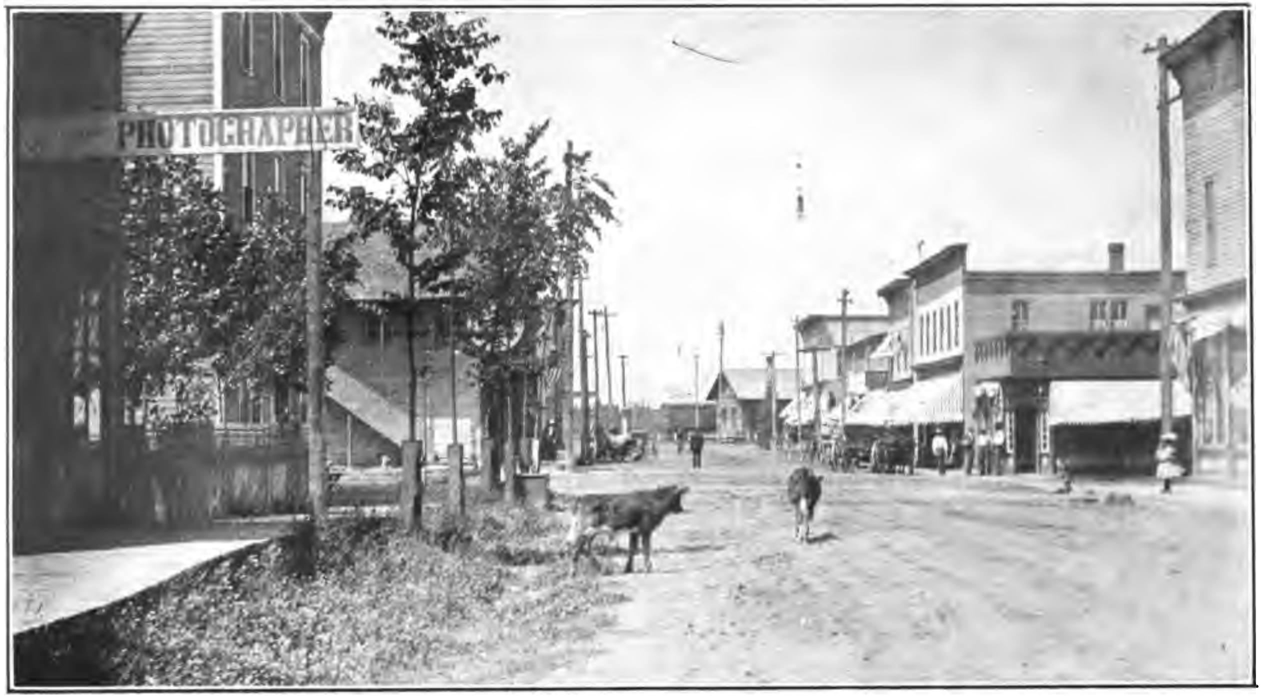
Mr. Hale: Did you ever commence when they commenced to open?

Mr. Marshall: No, not as early as that, but I sprayed when in full bloom.

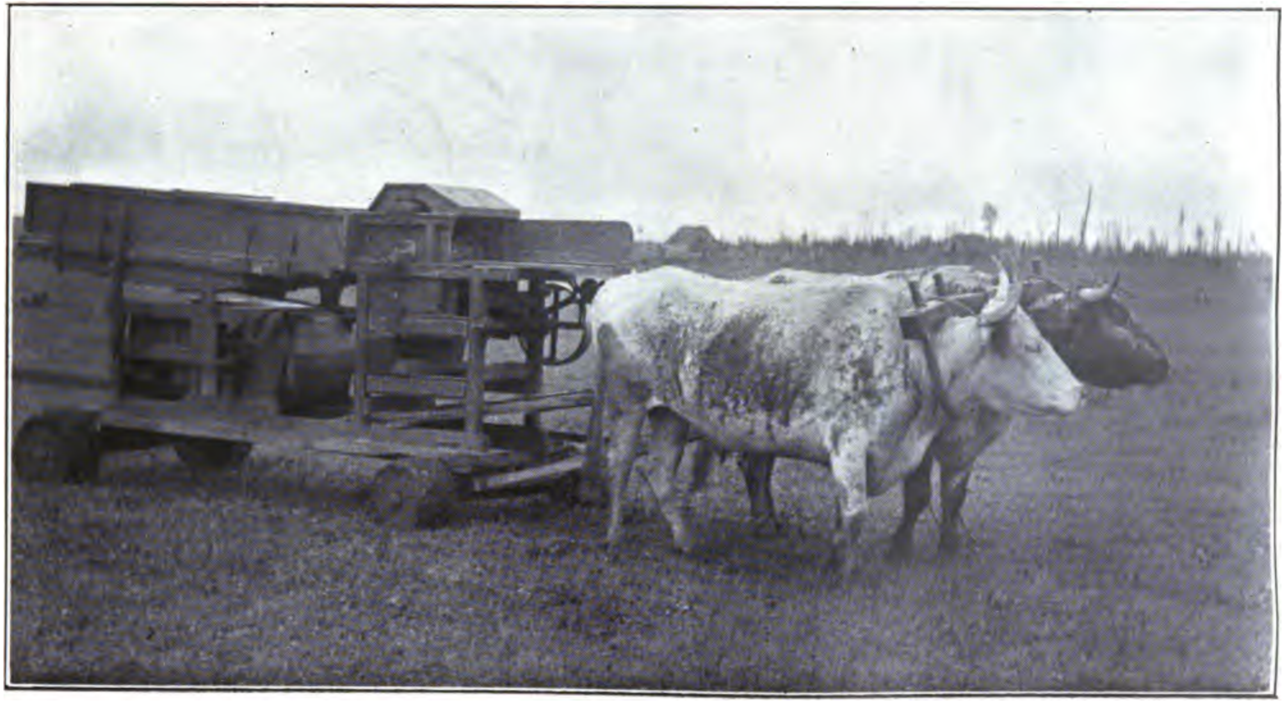
Mr. Irving Smith: Is there any danger of injuring the blossoms?

Mr. Marshall: There are so many you can afford to destroy some of them.

Mr. Bingham: Do you consider spraying the cheapest way of combatting the curculio?



MAIN STREET OF EAGLE RIVER, WIS., MAY, 1905.



THRESHING OUTFIT, DOUGLAS CO., WIS.

Mr. Hale: By all means, and while you are doing that you are doing something else.

Mr. Hale: As far as the curculio is concerned, if there is anything I can say to make you believe as I do I want to do it. I have grown plums for fifteen years, and for several years we had the peach curculio and we used to catch them, but I have not had a curculio catcher in my orchard for five or six years, and you cannot find a stung plum in my orchard.

Mr. Geo. J. Kellogg: How early does he find the buds?

Mr. Hale: That depends upon the condition of the weather. He comes on the very first warm day, and when the trees commence to start you will find him. The first spring I sprayed I believe I killed them all.

Mr. Bingham: A few years ago I began to catch the curculio at night and we are still doing it, and in a few more years I believe I could advocate that spraying is killing them. We are keeping that up and we are destroying them and getting rid of them in that way.

Mr. Hale: That, gentlemen, has been my experience exactly, but I also believe in spraying and I tried it thoroughly, and while I hardly had faith enough to think it was effective, I cannot find any now.

Mr. W. B. Cole: Do you give your plum orchard thorough cultivation?

Mr. Hale: Most assuredly I do.

Mr. Cole: The growers in Wisconsin who give their orchards thorough cultivation have no curculio.

Mr. Hale: I can see readily that there would not be so much trouble if you gave the orchard clean cultivation.

Mr. Palmer: My neighbors asked me to come and spray their trees, and I sprayed them three times, and there were very few curculio in that orchard, but on the other side of the street you could see the difference in the plums.

Mr. Bingham: I would like to say a word right along that line. I have an orchard of the Americana plum that is surrounded on two sides by woods, and the trees in the first row are planted within fifty feet of the woods. I have never used a curculio catcher, but I have sprayed and cultivated and I have not a curculio, and I have always laid that fact to the spraying and the cultivation I gave that orchard.

Professor Sandsten: At the Experiment Station it has been the practice up to three years ago to put on a mulch, but at the same time we sprayed the orchard, and, of course, the curculio were always with us. Then we discarded the mulching system and in that way we got rid of the curculio. While spraying is a good thing for curculio, I want to emphasize the fact that clean culture has as much to do with it, if not more, than spraying.

Mr. Hale: I do not want to run up against the professor, because they are supposed to know more about those things than a plain farmer. I have always practiced clean cultivation in my orchard, and while my plum trees had good care and clean cultivation, without the spraying, I have picked at one time from 150 to 200 curculio from a single jarring.

Professor Sandsten: You must have "buggy" neighbors.

Mr. Hale: I know what curculio are; they had them in abundance.

The President: You might have them in that case if you cultivated and sprayed.

Mr. Hale: Yes, I might have them; that is always the trouble in such a case.

Mr. C. L. Richardson: Are the plum trees very large and do they shade the ground very much?

Mr. Hale: The plum trees at the present time are from twelve to sixteen years old and stand twelve to sixteen feet apart. Litmus paper is all right and is much easier to use.

Mr. Bingham: Would you not set them any closer?

Mr. Hale: Not plum trees. I have neighbors within eighty rods of me, they have plum trees, they do not spray and they never have any plums.

Mr. W. S. Hager: You can cultivate out disease.

Mr. Hale: Yes, every one of those things works hand in hand together.

Mr. W. A. Toole: Is it any more difficult to control the plum curculio in the apple orchard than it is in the plum orchard?

Mr. Hale: Not a bit.

Mr. Schermerhorn: I am living in Illinois, and I am positive that the spraying for the plum curculio in the apple orchard is an absolute benefit.

Professor Sandsten: In regard to the Bordeaux Mixture, the question was asked whether 4 lbs. of copper sulphate and 4 lbs. of lime was the proper proportion. Our experience at the Station in most cases has been that used in that proportion it has burned the foliage, and I have advocated 4 lbs. of sulphate and 6 lbs. of lime. That is what I would suggest, 4 lbs. of copper sulphate and 6 lbs, of lime.
You can judge whether they cover the ground.

Mr. Hager: Do you use anything to tell when the acid is neutralized by the lime?

Professor Sandsten: Yes, there are two or three ways by which to tell. One is with a solution of ferro-cyanide of potassium; you drop a little of that in the mixture and if it curdles and turns brown you have enough lime. You can also put in a steel knife and if it becomes coated that forms a good test. Litmus paper is all right and is much easier to use.

Mr. Hale: We use an exact amount necessary to neutralize the copper sulphate. In my experience in spraying strawberries I have come to the conclusion that by using an excessive amount of lime it interferes with the action of the solution upon the leaves.

Professor Sandsten: It does to some extent.

Mr. W. S. Hager: There is a blue litmus paper and a red. If you use the blue in the acid it will turn red, and if you use the red in the lime it will turn blue, and if you add lime to the acid, to the copper sulphate, when it is exactly neutral the paper will remain blue or red, as the case may be, but if you put in an excessive amount of lime it will turn red.

Mr. Geo. J. Kellogg: How about the aphis?

Mr. Hale: We have them, but they get on the under side of the leaf and it is hard work to get at the little fellow. You can't do it by spraying because it will not reach them.

Mr. Geo. J. Kellogg: It comes as quick as the leaves come.

Mr. Hale: Anything you can get to touch the aphis will kill them, but it is hard to get at them because they are on the under side of the leaf which is curled up. Kerosene emulsion will do as well as anything I know.

Mr. S. H. Marshall: I think any kind of dust put on with a dust sprayer early in the morning will do a great deal of good.

Mr. Hale: If a dust sprayer will do that it is a good thing. I want to ask Mr. Schermerhorn about that.

Mr. Marshall: The dust does not need to be poisonous; road dust is as good as anything.

Mr. Richmond: Have you ever tried London purple?

Mr. Hale: London purple does not seem to have the same uniformity of strength and for that reason it has been almost discarded.

Mr. Bingham: How many applications of Bordeaux Mixture are considered necessary in dealing with the shothole fungus on the cherry?

Mr. Hale: The first is almost all that is necessary, yet I think another spraying following some time after the first will be beneficial.

Mr. Marshall: I have one more question to ask about plums. I use in my early spraying, before the buds start, 6 lbs. of copper sulphate on the theory that I have always thought 4 lbs, was not strong enough, and I want to ask if the other two pounds add to the efficiency of the mixture or whether it is wasted. I know it has never done any damage.

Mr. Hale: I was going to mention that usually it is not safe to go ahead of the professors in their experiments. I said in using the vitriol alone I used two pounds of blue vitriol, and Professor Taft has told me repeatedly that anything more than that was useless. I use 4 lbs. in the Bordeaux Mixture, and if that does the work what is the use of wasting two pounds?

Mr. Marshall: The late Professor Goff told me he thought 6 lbs. was better than four.

Mr. Hale: I do not want to tell you people what to do, but this is much stronger than Professor Taft mentioned.

Professor Sandsten: I have always advocated this spraying, and I have always advocated 4 lbs. of copper sulphate and with very good success. I hardly think Mr. Hale makes a fair statement when he says that we are so many years behind Michigan in spraying. Many of our commercial growers spray and there are many others who spray, and there are also a great number in Michigan who do not spray. I think we are pretty well up with the times in that respect.

Mr. A. C. Hatch: Is it more important to coat the top or the bottom of the leaf? I was talking with two orchardists and the both said they believed in spraying and practiced it, but they sprayed the top of the leaf. My idea is to coat the under side of the leaf. Some professor can tell us whether the spore gains admission to the leaf at the top or on the under side.

Mr. Hale: Just a word before the professor answers that question. I hardly think we would spray if we waited till the wind was strong enough so that both sides of the leaf would be covered. Some people in our state wait till the wind is just right or until they get the right kind of weather. If the wind blows a little bit it is too windy, or if it rains the rain will wash it off. We can't afford to do that, we have got to spray whether it is windy or not and if it rains we have got to do it between showers.

Mr. Marshall: I want to endorse that idea, but I don't think I would stop even if it rained, I would keep right on.

Professor Brown: Answering the question that was asked a moment ago, the best results are obtained by covering both sides of the leaf, but the upper side would be more apt to contain the spores of the fungi.

Mr. Palmer: With a good sprayer you can get it on all sides of the leaf.

Mr. Hale: The essential thing is to do the spraying thoroughly and you will get results.

Mr. Geo. J. Kellogg: Would the first application of this blue vitriol hurt the strawberry leaf?

Mr. Hale: No, sir, not early in the spring.

The President: I want to ask a question, which is a very important question. Can you depend upon the men doing the work thoroughly in applying this Bordeaux Mixture, when the wind is blowing strong so that they and the horses are covered all over? Will they do it well without you seeing to it yourself?

Mr. Hale: I almost always have hold of that nozzle myself. (Applause.)

The President: That is a pretty good way to get it well done.

Mr. Hale: There is no work in the whole business of fruit growing that I detest so much as this spraying, but I could not do without it now.

Mr. Bingham: To do away with this covering of horses, wagon, and men, we do not spray toward the wind, but we spray with the wind, the way the wind blows, and when the wind blows in the other direction we spray on the other side, and in that way we do not have any of the material come back on us.

Mr. Hale: You are an exception if you can spray and keep the horses clean.

Mr. H. G. Street (Ill.): Do you make a practice of spraying on both sides?

Mr. Hale: I don't spray against the wind when it is too strong, when it comes on too strong I can't do it. We go in day in and day out, and when I tell you it takes from four to six weeks to spray you may know there is something to it.

SPRAYING.

A. V. Schermerhorn, Kinmundy, Ill.

After what these professors and Mr. Hale have been telling you about spraying I suppose you will think it is a business proposition and that there is something in it. I commenced to spray—let me see—about 1889, and I sprayed more than six years and there was nothing in it. I lost some trees. My observation during the last six or seven years in going pretty well over the country, especially in the commercial apple growing section in southern Illinois and other states, still gives me the impression that spraying does not pay as practiced by every man or orchardist that is trying to spray. Why doesn't it pay? I will try to tell you a few things that may give you an idea why it does not pay. I will just give you a few points along this line, instead of a lengthy address, in order to draw out discussion, and after I am through you can ask all the questions you please.

The business end of this proposition is, Does it pay? I am very sure it does not as practiced by at least one-half of those who are trying to spray. There is no other orchard operation so important, or that will bring one-quarter the returns as spraying properly done. Spraying properly is a very simple operation. The combining of the Bordeaux Mixture and the insecticides correctly is not difficult. In order to be successful, the first thing necessary is that the one directing the operation should know something about the enemy he is fighting. This information is easily obtained from your horticultural reports and experiment stations, and, second, the mixture must be properly combined. Bordeaux Mixture, in order to obtain the best results, should be combined in a diluted form. To prepare 100 gallons, dissolve 8 lbs. of blue vitriol in 50 gallons of water; add eight pounds of lime, thoroughly slaked without burning, to 50 gallons of water. When the same is dissolved and well stirred, combine the two and you will have a perfect mixture, after which add your insecticide, 8 oz. of Paris Green. Then, third, you must know how to apply it. All materials should be strained through a fine brass wire screen, and the spray tank should be kept tightly covered to keep out anything that would clog the pump valves or nozzles. The application should be in the form of a fine mist that will float in the air, and that will adhere to the lower side of the foliage and twigs as well as to the tops. It is necessary to use the very best brass pumps that will give a good pressure. The fourth step is to know when to apply it. This will depend largely upon local conditions. In the commercial apple growing sections of Illinois, we have found that winter spraying, or spraying when the orchard is in a dormant state, with Bordeaux Mixture or a weak solution of blue vitriol does not pay. We get the best results by making the first application when the bloom buds begin to burst; the second application when the bloom is shedding or petals are falling, and the third application ten days later. It pays well to make later applications in seasons that are favorable for the development of apple scab. It should be understood that the greater part of the benefits of spraying come the following year.

I have a few little illustrations here I would like to show you, but I don't know whether you can see them. These are taken from photographs of Illinois orchards. Here is one (showing photograph) giving a specimen view of Senator Dunlap's orchard at Savoy. The first ten trees in this orchard were not sprayed, the other conditions, however, being exactly the same so far as cultivation and care was concerned, with the exception that these trees were not sprayed. This (indicating) is a little pile of apples, probably a bushel and a half, from the trees that were not sprayed, and the foliage was nearly all off the trees. Here is another pile (indicating) from the trees that were sprayed, the trees having a heavy foliage like in June. It is easy to see the difference.

I want to show you something about this proper combining of the Bordeaux Mixture. I have a little illustration here that will make it somewhat more clear to you. Here is a chart (exhibiting chart) showing it in the diluted and concentrated form. Here (indicating) it is shown after it has been combined twenty minutes. This chart (indicating) shows it combined in the diluted form, so-called, and you can scarcely detect any settling in the tube. This (indicating) was combined in the concentrated form in the old way. Here (indicating) the blue vitriol is coming to the top. I will show you these charts again after they have stood an hour. This chart (indicating) represents the product of the mixture combined in the diluted form, and this (indicating) the concentrated form. This makes a very smooth mixture and will retain the poisons, arsenic or Paris Green, much better, and is not so liable to burn the foliage as the combined concentrated form.

DISCUSSION.

The President: You said, at the beginning, that it did not pay to spray the way it was usually done. Will you tell us what you meant?

Mr. Schermerhorn: It is simply because people leave out those necessary details. It is not a hard proposition. It is not a difficult matter to slake some lime thoroughly. If you were going to slake lime when you plaster you would not allow it to burn, and you must be just as careful about it when you spray. To be brief about it, I pass the lime through a brass screen, I use a special size brass screen—I forget how many meshes to the inch, but it is like a milk strainer,—that is what I strain my lime through, and if you will make that kind of a mixture you will have no clogging of the nozzles. Most people are careless about those things. The greatest trouble is not in slacking the lime right, although they get mixed up on those things, but the greatest trouble lies in the improper application. You want to get a good pressure on the pump and the spray wants to be as fine as mist, so it will adhere to the top as well as to the under side. You have got to have a fine stream so it will cover everything evenly and not leave portions of the leaf exposed, and then you want to stop before the leaves begin to drip. It is a pretty hard thing to do these things just right.

Mr. Geo. J. Kellogg: I thought you said it was easy. (Laughter.)

Mr. Schermerhorn: Oh, it is easy when you know how to do it.

Mr. J. J. Menn: The minute your lime is burned it is worthless. Is not that true?

Mr. Schermerhorn: I think so. Let me tell you something. The man who lives next to me has an orchard of 260 acres. He was going to do the thing cheap so he hired some boys to do his spraying. He said boys could do it just as well, there was no use to hire men at $1.50 a day to do that spraying. Profesor Blair was with me when we looked over his orchard, and we could see every place where that nozzle went; you could see the effect upon the foliage, where the nozzle struck it was all off. Those trees were bare the latter part of July, where the nozzle went, and you could see where it went all over those trees. If they had a little blue vitriol left they would let it run out on the ground about quitting time. The result was he had no apples, and while that orchard is seventeen years old he has not had apples enough to pay him for the time he has put into it.

Mr. Irving Smith: Is a combination of blue vitriol and lime worthless when it stands over night?

Mr. Schermerhorn: I think not; I don't know how long it would retain its strength.

Mr. Irving Smith: It has been many times stated that it was of no value if it was kept over night. I saw that statement in print only last summer. When we sprayed and had any left—we usually did not leave much, but if we had any left—we threw it away because we thought it was of no more value.

Mr. Hale: That question came up in Ohio and they claimed it was no good. I have gone on and sprayed with that mixture when it was thoroughly mixed and it was all right.

Mr. Schermerhorn: If that mixture is worthless I am ready to sit down, because I have used it after holding it over from one spring to another. If that is worthless I want to know it.

Mr. H. G. Street (Ill.): Do you slake your lime with cold water?

Mr. Schermerhorn: Yet, with cold water. It will slake a little more quickly with hot water. I generally slake two barrels at a time. I have a man go with the horses—I am like Mr. Hale—I do all the mixing myself, and I do all the slaking of the lime myself. I run two outfits, and I let the other fellow drive the horses and I attend to the spraying. I tell you it is all work, there is no play about it. It is pretty hard to tell you just how to do it, but Mr. Hale ought to tell you how to do it.

Mr. Geo. J. Kellogg: I thought that was so easy. (Laughter.)

Mr. Schermerhorn: Oh, yes, yes, that's easy. I keep my eye on the lime all the time.

Mr. Palmer: Do you dissolve the vitriol in hot or cold water?

Mr. Schermerhorn: Yes, with cold water. It will slake a stock solution, but I don't do that. I have got two 100 gallon tanks elevated. I have a little cut of them here. (Exhibiting picture.) (I have to make a living besides this going around to different meetings.) Anyway, I have got some elevated tanks. Here is a 100 gallon tank up here (indicating), and down here (indicating) is the receiving tank. I take all the blue vitriol and put it in a burlap sack in the tank and it will all dissolve in five minutes. I can soak it up and dissolve it in five or six minutes. A good many people make a stock solution and use so many gallons. It does not make any difference how you dissolve the blue vitriol, but if you dissolve it in hot water it will crystalize at the bottom of the vessel. It is very important to dissolve it in cold water.

Mr. W. J. Moyle: How long do you leave this blue vitriol in the tank?

Mr. Schermerhorn: Just the minute it is dissolved use it. I have let it stand there two days and then used it.

Mr. W. J. Moyle: Recent experiments made down in New York in regard to the water used in New York City, they found where they used blue vitriol in those large water tanks, they found what they call algae were all killed, and all the other worms. They found this same water was absolutely free from any deleterious effects by reason of the neutralizing effect of the blue vitriol upon the water.

Professor Sandsten: I can explain that. It is carried on by the algae themselves, which are partly mineral, and combined with the blue vitriol produce this effect.

Mr. C. A. Hatch: Is there any difference in the value of the Bordeaux Mixture freshly made and that which stands for a time?

Mr. Schermerhorn: Well, the Bordeaux that stands for a time may be a little less effective than that which is freshly made.

Mr. Geo. J. Kellogg: You said you could dissolve that 16 lbs. in how many minutes?

Mr. Schermerhorn: About six minutes in 100 gallons of water. That is about the time, I would not be so exact about it.

Mr. Geo. J. Kellogg: Within an hour anyway?

Mr. Schermerhorn: Oh, yes, within an hour and a half at least. (Laughter.) I used to leave it in over night. I ran out from 1,200 to 2,000 gallons of Bordeaux Mixture a day in my orchard. That usually lasts about three weeks and it gets to be a pretty serious business before you get through. I have got to make everything count. I have no time for stock solutions. I have got my lime box and I dissolve my blue vitriol and it keeps me humping to have it ready for them, and then I have got to go to the orchard to see that they are earning their wages, and I tell you there are a good many things to look after.

Mr. Hale: I want to say a word about stock solution. I avoid that as much as possible. I have no time to go into all these things, but I dissolve my vitriol and go ahead. Mr. Schermerhorn uses a gunny sack or a burlap sack. I now use a common flour sack, and I find it better for this reason, it avoids getting in a great deal of that lint, but don't let the blue vitriol get down and remain undissolved.

Mr. Geo. J. Kellogg: Do you suspend it?

Mr. Hale: Yes, but some people leave it in and it does not dissolve.

Mr. Palmer: What is the average price of blue vitriol?

Mr. Hale: I think it is 5¾ cents.

Mr. Schermerhorn: I pay 6¼ cents.

Mr. S. H. Marshall: It costs us seven.

Mr. Geo. J. Kellogg: It costs us 15 what we get from the druggist. (Laughter.)

Mr. Schermerhorn: Well, I bought it by the ton and I paid from $6.10 to $6.15 per hundred for it.

Mr. Hale: Was this especially for apple trees?

Mr. Schermerhorn: For everything, for apple scab, fungus, coddling moth, curculio, canker worm, and everything else.

Mr. Hale: For all those things?

Mr. Schermerhorn: Yes.

Mr. W. B. Cole: You say you make this application just as the plum buds are bursting, and I believe you said you used the weak solution.

Mr. Hale: I said I did not believe it paid to spray in the dormant state.

Mr. Bingham: Is that statement confined to the apple?

Mr. Hale: I don't know anything about anything else, because I never sprayed anything else except plum trees. I had some very large trees and I sprayed those as far as I could reach, and, I tell you, as far as that nozzle went there is quite a difference in the plums. I am not in the fruit business for my health, or as a fad, or for any other purpose than to get my living out of it, and that is the way I get it. I look at it from the standpoint of dollars and cents; it is a business proposition with me.

Mr. Bingham: Do you spray your strawberries?

Mr. Hale: No, sir, there is nothing to spray for. I have a little rust on some varieties, but I would not advise anybody to plant those varieties. When we get our plants from Illinois we get a few leaf rollers, but we are not troubled very much.

Mr. W. B. Cole: Mr. Hale says he sprays in the winter time before the foliage starts, and Mr. Schermerhorn says winter spraying with him is not necessary. Now, are we to assume that if we do spray our apples in the winter time before the foliage starts that it is not necessary to spray our plums and cherries?

Mr. Hale: I think Mr. Schermerhorn's talk was about apples and mine was on something else. When I said in the winter time, I did not mean in February or so early in the spring before the weather becomes warmer. I don't want to spray so an icicle will hang on the nozzle. But that is the time to spray, before the buds start. It would vary with the season and the locality, but I think in Michigan it would be about the 10th of April.

Mr. W. B. Cole: That is it exactly; what I am trying to find out is whether it is necessary to spray our apple trees before the foliage starts.

Mr. Hale: Mr. Schermerhorn says no, but he answers that from his standpoint.

Mr. H. B. Hotchkiss. Someone has advised spraying when the foliage is about the size of a rat's ear.

Mr. Geo. J. Kellogg: I understood Mr. Schermerhorn to say he sprays when the plum buds are just opening, or was it when the foliage is opening?

Mr. Schermerhorn: Just before the plum buds begin to burst.

This applies to Illinois, but I don't know whether that same course would be effective in Wisconsin.

Mr. Geo. J. Kellogg: How many times do you spray after that first application.

Mr. Schermerhorn: Twice; when the petals begin to fall and next application ten days later, but where trees are infected with apple scab, I would recommend spraying several times.

Mr. Geo. J. Kellogg: Don't you think the second brood of codling moths comes on in July.

Mr. Schermerhorn: I don't think the spraying would justify the expense to get the second brood. I don't believe you can get but a small percentage. I do not know much about that second brood of the codling moth. I would like to hear from the professors on that subject.

Mr. Hale: Just one word more. I made some pretty strong statements. Mr. Cole was at my place and saw my plum trees in the orchard, and he also saw my cherry and apple trees, and he can tell you how they compared with others. You don't need to ask him until after I am gone.

Mr. W. B. Cole: Last winter at our meeting, Mr. Hale set me all afire with this idea of spraying. I became thoroughly interested and went home determined that what other men could do I could do. I went to work and sprayed; I sprayed thoroughly, and I sprayed everything. I guess I made some mistakes. I sprayed my apple trees in the latter part of March and I sprayed them three times. Now, being thoroughly satisfied with what I did, I thought I would take a little trip for recreation, so I went over to Michigan to see Mr. Hale, and I found him a busy man. Mr. Hale took me all through his orchard, and I can verify every statement he has made to you today. His plum trees, peach trees, cherry trees and, in fact, everything was in as perfect foliage as it could be in June, and right along side was another cherry orchard and I don't believe there was an average of ten leaves on a tree. His fruit which he had was simply perfect. I did not go over there to make a comparison to see how well I had done, but I went over there to find out where my mistakes were, and I found a good many. I felt well repaid for going over there, and if any of you want to see a well kept orchard with thorough culture, and anyone who wants to make the greatest success in the fruit business. I would advise him to go and call on Mr. Hale.

Mr. W. M. Toole: We may see a discrepancy in the statements of the two gentlemen, but one is spraying for apple scab and the other for shothole fungus, and that may account for the difference.

Professor Sandsten: All I can tell you in regard to the second crop of codling moth is that if you do your job well the first time you don't need to do it over again. That has been our experience. We spray very thoroughly the first time and we do not spray a second time, and we have very few codling moth, but we do the job thoroughly the first time. If you do that you don't need to do it again.

Mr. C. A. Hatch: I don't agree with the speaker at all, because this year I sprayed and sprayed thoroughly, and I have sprayed fifteen years for the codling moth, and this year I am sure I lost two or three hundred dollars' worth of apples on account of their being wormy. I have been spraying right along year after year, so I know it is not true that you can kill them by this spraying.

Professor Sandsten: Mr. Hatch did not spray at the right time. If he had sprayed at the right time, and it had been thoroughly done, I don't think he would have had that experience.

Mr. Geo. J. Kellogg: I think Mr. Hatch sprayed all right, but he got them from his neighbors.

Mr. Schermerhorn: I would like to ask you something about your surroundings. I would like to know what the conditions are around you.

Mr. Hatch: There is an orchard across the road which the owner has not touched for fifteen years.

Mr. Schermerhorn: That is where your second brood comes from.

Prof. Sandsten: This is like a good many other things. You can't eradicate this evil in one year, you have got to keep at it. It is just like working out your own salvation as the preacher tells you, you must keep at it.

Mr. Hale: Don't you think you are going to eradicate everything in one year.

Mr. Schermerhorn: I just want to say another word or two. Don't expect to get returns in one year. It will pay you to keep at it year after year and your returns will surely come. Don't lay all the stress on the fruit itself, look further ahead, you are not doing it all for the fruit you expect to get this year or next year, but you are doing this work for the future.

Mr. Irving Smith: How do you get around the trees to cultivate up to the stub, how do you get around the lower branches?

Mr. Hale: With a spring drag and harrow.

Mr. Irving Smith: Do you use a Shetland pony?

Mr. Hale: Not a bit of it. That is an amusing question to me. In the peach orchard when the crop is on we have the limbs bend down low and you may wonder and imagine how we get around the tree and get up to the trunk of the tree. We twist around, we get on one side of the tree with the team and then we come down on the other side.

Mr. Irving Smith: Your trees are only fifteen feet apart, can you work a team in between them?

Mr. Hale: I can.

Mr. L. G. Kellogg: We have a cherry orchard of about ten acres and we are cultivating it with an extension disk harrow which we purchased in Ohio, and it works very successfully. It will reach out under a tree and will cultivate within a foot of the trunk or nearer. Our cherry trees are planted 18x21 feet, and we also use the spring tooth and make an extension so it will reach out under the trees, and it works very satisfactorily.

Mr. Schermerhorn: I would like to tell you what I use. I have a forty acre orchard and the trees are so large that the limbs interlace. I take a Clark cutaway harrow and two horses and get close enough to bark the tree. I take the lever off and set the angle clamp underneath and let it right out to the middle of the row and put on a 16 foot crosshead, and in that way you can go up one side and down the other, and in that way I can work the disk in or out or keep it perfectly level.

Mr. Philips: What do you use to fertilize your trees?

Mr. Schermerhorn: Our soil is so rich we can raise apples without fertilizing.

Mr. Edwards: Are you troubled with blight, and do you use the Bordeaux formula?

Mr. Schermerhorn: We have a little and it kills the twigs back on some varieties six to eight inches. It makes the tree look bad, but it does not injure it further than to make a lodgment for the bitter rot spores and canker. I want to tell you something about that bitter rot. I don't know whether you have the same kind we have or not. I was in four counties and by a careful estimate the loss from this bitter rot was placed at $1,500,000, and we had lots of apples and we hardly missed them. I was talking with Senator Dunlap about the ravages of apple scab, fungus and so on, and I asked him if he did not think we suffered more that year in the amount of damage from bitter rot than we did from all other things put together, and he thought we did, and I am quite sure we did. I believe the apple scab fungus in our section of country causes us more loss than all the other troubles put together. I would like to hear from Mr. McClay. He is not only a buyer, but he is a grower of apples, and he is a man who is competent to speak on this subject.

Mr. McClay (Chicago): My orchard is quite young and I have not carried these experiments out to the extent that these other gentlemen have, but I thoroughly believe in spraying, and I thoroughly believe that if we have to do it we should do it right.

Mr. Geo. J. Kellogg: When is the best time to spray for apple scab. You tell your story and I will believe what you say. I am talking to Mr. Hale now. (Laughter.)

Mr. Hale: I am very grateful for the compliment. I agree with what Mr. Schermerhorn says about apple scab. He told you this spraying was for apple scab, codling moth, curculio and many more things. I was a little surprised because he included all those things, but that first spray to my knowledge is more especially for scab, and I don't know why he wanted to include the codling moth at that time. My first spraying is on plums, peaches and cherries, not on apples, I did not say a word about that. That first spraying for apple scab should be thorough, and for that first spraying don't let it be a minute later than he told you. If I should give you any advice I would say spray earlier than that even. I use the Bordeaux mixture. I have practiced spraying with blue vitriol a little earlier on apple trees than Mr. Schermerhorn told you. I am not convinced how early you can do it and have it do any good, but you cannot have it done any later than he told you and have it do any good. But we cannot all do it just at the same time. I will tell you a little experience I had this last season with an orchard I had rented. It was an old orchard and it went along for years without pruning, cultivation or anything else. You could hardly throw a stone through the trees, but I wanted to get hold of that orchard and experiment with it. I did not get hold of it until this last season and the leaves were ready to start, in fact, they were pretty well started, and I commenced spraying with blue vitriol alone. I always handle the nozzle myself. I had to go away at that time and I left my man to do the spraying. I was working in that orchard as an experiment more than anything else, and I was using 6 lbs. or a little stronger of blue vitriol in that apple orchard. I went away on Thursday morning and on Thursday night it turned warm. Now those trees leaved out overnight and a fungus growth struck them. I had a good man in charge and he sprayed those trees, with the foliage started as much as it had, with a mixture stronger than the professor told you. I came back on Saturday and he told me what he had done, and everything was just as black as my hat. I said. "You have fixed it surely; we won't have any scab or apples." The outcome of it was that no better apples did I ever raise than I raised in that old orchard. It was the best lot of apples and the clearest from scab from that old orchard that I ever saw.

Mr. Schermerhorn: Talking about spraying for scab, while you are spraying you might as well spray for the codling moth, curculio and everything else. Does the codling moth feed on the young leaves when they first start out their buds? If they do not I am misinformed. I never saw them feeding on the leaves, but that is my understanding of the matter, although I may not be right. We want to get at the truth of these things, and we want to be careful about the statements we make so they will not mislead anyone. We want to understand these things and be sure we are right.

Prof. Sandsten: I think you can be particularly sure that the codling moth does not feed on the foliage. The foliage is safe from the codling moth. The moth has no eating or biting organs; the moth does not feed.

Mr. Sperbeck: Is there danger in using this Bordeaux mixture of poisoning the bees at that time?

Mr. Hale: I don't know who you are asking that question of. Now don't get these questions confounded. Mr. Schermerhorn told you to spray when the bud shows pink. Other buds form before the blossom bud proper appears, but don't wait till it opens up. This is an essential point.

Mr. W. J. Moyle: I have had the fact called to my attention that we can spray one year and destroy all these insect pests that trouble our fruit and then have a good time for a year or two.

Mr. Hale: My experience has been that it has no effect at all to spray only for one year, the insects are more numerous the next year. One thing further I want to tell you that some of you may have been in the habit of doing, and I used to do it myself, when I came to a tree I would spray the part that had the fruit on and let the rest go. I see now how foolish that was. The idea is that we must spray the tree all over and spray every year whether there is any fruit or not. That is the only way to keep ahead of insects and diseases that trouble our trees.

Prof. Sandsten: If you destroy the insects one year they will come in all the stronger the next year. They are just like religion, sin is always with us. (Laughter.)

The President: It is about time to close this discussion, and I have this to say in regard to this discussion. I have never been so pleased at any session I have ever attended than I have been with the sessions we have had here this year. There has been a wonderful interest displayed and uniform good nature has prevailed in the discussion of every problem you have had before you. I hope next year we will see every one of you here again with a hundred or two more, and that you will all be ready to enter into the discussion of any subject that may come up as heartily as you have entered into the subjects we have discussed at this meeting.

THE McMAHAN APPLE—ITS HISTORY.

C. A. Hatch.

The seed that produced this beautiful apple, and its twin, the McMahan Bloom, was planted by Mrs. Isaac McMahan in her garden, in 1860, the seed being obtained from a large red apple coming from Ohio, presumably an Alexander. The McMahans lived in the Town of Bloom, Richland county, one mile from what was then known as West Branch P. O. on the West Branch of Pine river.

In the fall of 1869, McMahan exhibited the two apples at the Richland County Fair, held in Richland Center. The fruit was so large and fine many could not believe it was a seedling, but A. L. Hatch, brother of the writer, visited the farm during the following winter and was so sure of the trees being seedlings he cut all the scions and sprouts from the roots and it was through these scions the varieties were introduced to the public through the Richland County Nursery, carried on by the late S. I. Freeborn and A. L. Hatch, now of Sturgeon Bay, Wisconsin.

In the year 1870, the Richland County Horticultural Society, at the request of Freeborn and Hatch, named the white apple McMahans White and the red one McMahans Bloom. The Bloom proved to be undesirable on account of blighting so freely and is no longer propagated, although aside from this weakness a very desirable kind. The McMahans White proved so satisfactory that it is one of the leading varieties in this part of the state.

The foregoing is ancient history. How about McMahan up to date? It is one of the most popular varieties for market purposes grown in our county, for the following reasons:

As to tree it is almost ideal, broad, spreading, making it low, therefore easy to pick, prune and spray, strong and vigorous of growth, consequently having size, so necessary to carry large crops; every fork is strong and well grown together with no inturning bark, foliage large, broad and vigorous.

As a tree it has one fault only, not being blight proof, having this weakness which is common to all strong growers. But in my own orchard containing over thirty varieties, it stands about fourth in resisting power. Alexander, I would put as the weakest, although there is not much difference between that and Yellow Transparent, Yellow Transparent, 2nd, McMahans Bloom, 3rd, and McMahans White, 4th. Being a low topped and spreading tree it requires much room, therefore should not be set closer than thirty feet from any other tree, nor headed lower than three and one-half to four feet. It stands pruning well, in my experience I have removed limbs three inches in diameter, two at one time, from one tree with no inconvenience as far as could be seen, work which would have ruined a Golden Russet and sent a Tetofshy to the rubbish pile.

PRODUCTIVENESS.

Its producing power is second to none out of over thirty kinds grown under similar conditions. Other varieties may have more apples in number but McMahans come up smiling when it comes to number of barrels of merchantable apples, and yet they seldom, if ever, need thinning for the tree seems to know just how many it can mature and the rest drop off, while Duchess or Wealthy would struggle to carry them all, and unless the grower came to the rescue by thinning, there would be only inferior fruit at picking time.

Other kinds may have more red on their cheeks, more quality, keep longer, but for an apple to please consumer, grower and handler, give me the McMahans White. It can be grown for much less than some others for the trees never die, if once started, it takes less work to care for them, and they can be picked and put in the barrel for less than one-half of what it takes to put some other kind there. I say, all hail to the

McMahan's White! What the Ben Davis is to Missouri and Illinois, the Baldwin to New York, the McMahan is to Wisconsin. The fruit getter, the money maker. If you want to wear a smile in this life and leave an inheritance for your children when you go to the next, plant McMahans.

DISCUSSION.

The Secretary: I want to say a word in apology, if an apology is necessary, for giving so much space to the McMahan apple. One member expressed surprise that six men should be require to discuss the merits of one fall apple, but in placing the McMahan apple on the program I had in mind the comprehensive and valuable discussion in regard to the Northwestern Greening apple in this Society four years ago, because that discussion did more for the Northwestern Greening than anything that has ever been done before or since. We find quotations from that discussion all over the United States. I had seen last fall the McMahan apple. I saw thousands and tens of thousands of bushels, and I found the apple was little known outside of Wisconsin. For that reason I wanted it to be more widely known. I think our papers and discussions are widely disseminated, and through the presentation of its merits here it will be more widely known in the future than it has been in the past.

Mr. Geo. J. Kellogg: What is its season? Is it not keeping later than usual?

Mr. C. A. Hatch: I don't think it is. It is not a keeper. I think one of the mistakes the Wisconsin people make is trying to raise a keeping apple. Michigan and New York are full of keeping apples, and when we come to compete with them we are running up against a snag. There is plenty of room for our short season apples. The McMahan does not keep well. This is the time the McMahan begins to fail. I have eaten them in fairly good shape in January, but it loses quality and flavor. They do not all have this blush on them. (Indicating.) I have never discovered a good test as to when it is ready to pick until this year. The buyer wants you to wait just as long as you possibly can, and the longer you wait the more this red appears, but when your apple begins to take on a waxy appearance then you want to get them off. I never discovered that until this year, but when you see that appearance on the apples then you want to pick them right away, and you cannot get them in better condition no matter how long you wait.

THE STATUS OF THE McMAHAN IN CHIPPEWA COUNTY.

C. L. Richardson.

Not being an apple grower, I am scarcely qualified to give you a report of the condition of the McMahan apple in Chippewa county. I find the apple is not very well known, and some growers do not grow it at all. In some instances a few trees have been planted, and some that were planted on clay soil with an eastern exposure, and I do not know why it was except it was the locality or the season, but in each case the tree died. I had a conversation with two of our largest growers in Chippewa county, one of whom has about fifty acres in orchard, and I believe it is also located upon a heavy clay soil, rather rolling, and with a northeastern exposure, and he reports on the McMahan apple. He says the tree is a good grower and a good bearer, that it is hardy to the extent that last winter, which was one of the most severe probably in our history, and which probably killed more fruit trees in our section than in any other, when many of the other vareties died the McMahan came through in a satisfactory condition. In speaking of his experience with the apple he states that it keeps better than the Wealthy, and he would recommend it for the severe climate in northern Wisconsin.

One of our other heavy growers, comparatively speaking—I think he has some thirty acres in orchard—reports that the tree is a good one, having a well balanced top, bears a crop every year for three years, and shows a tendency to produce a light crop the fourth year. He says the tree is not subject to blight, speaks of the excellent quality of the apple, calls its season an early winter, says in many respects it is as good as the Wealthy, but on account of its white color it is not liked as well upon the market as it would be if it were of a red color, and which fact he calls a fault. He advocates planting his trees 20x28 feet apart.

THE STATUS OF THE McMAHAN APPLE IN WINNEBAGO COUNTY.

Dr. T. E. Loope.

I have got probably about 400 McMahan trees. The trees with me did not come into bearing early. The main part of my McMahan trees are now twelve years and I have never had a full crop until this year, or what I would call a full crop. I do not know but what it is thirteen years since they were planted. They have borne several years before, but for that number of trees—and they are large trees now, you would expect a good many barrels of apples, and I do not believe I have got fifty barrels of apples before this year in any one year. The tree is as hardy and as strong wooded as an oak, you can hardly cut it. It is a good orchard tree, but it is a poor nursery tree, it grows too crooked. This year I had perhaps a thousand bushels of McMahan apples, all of that. I have, I think, about 400 trees, but they do not all bear. The trees that were bearing were unduly loaded, and the apples are so large and heavy that the limbs were on the ground, and with that big load on them it did not even break the limbs, they are as good as spring steel. They were entirely on the ground with their load of apples, and I have never seen a broken limb. That tree blights to some extent with me. That is in central Wisconsin. This year it did not blight, but some years it blights pretty badly. The apples bring a fair price, although it is not an apple that is sought after particularly, but the size of the fruit is what recommends it in our big markets. It is a better apple to sell away from home than at home, particularly so if you have sold it one year. I sent a carload to Chicago and they paid me as much for that apple as they did for any other I sold. I got $1.50 a barrel. I had too many apples. I was in kind of a corner, but even at that I got as much as they did in the East for apples grown in large commercial orchards; they only got one dollar a barrel. I have no particularly flattering report to present here. I am glad I have got them, but if they continue bearing as they do now I shall be satisfied, because usually you can sell those apples better than that. Usually they can be sold locally at 75 cents a bushel. They are large fine apples and you can take them on a wagon to Oshkosh and sell them at about 75 cents a bushel.

DISCUSSION.

Mr. Geo. J. Kellogg: Did you pick them all at once?

Dr. Loope: We picked more barrels of McMahan than of any other apple, and yet with my crop this year we went into the McMahan orchard for the carload that was ordered from Chicago, and we picked only the best and the largest apples, I made two grades, and I found I could have picked three times from those same trees. The small apples came rapidly forward. In one part of the orchard I told my pickers I wanted them to take all of the apples, and we selected out more apples of those McMahan than we put in the barrels, that is, second grade, because they were smaller. I could have gone in and picked the larger ones and left those and they would have come on later. The season is about November. This year the McMahan is keeping well until this time. In my vicinity a man had a barrel of McMahan with which he has taken no particular pains in the way of keeping and they are still in good condition. The beauty of the apples appears when they are in blush. There is no more beautiful sight than a McMahan apple where it gets the sunlight and acquires that blush. Those apples are not the kind of McMahan from which we get our best samples; what I mean, the color is not so delicate, it has not that red blush developed, it is more white. You have got to get the colors contrasted in order to get a good effect. That is about all I know about the McMahan. The McMahan apple, as Mr. Hatch indicated, is an apple for central and northern Wisconsin, because it will produce apples and it is a good, hardy tree, one that is going to do well and give you a large number of barrels of apples too. It is one of the best apples we can raise. Wisconsin wants to confine herself exclusively (I am speaking of northern Wisconsin) to the smaller and fall apple, particularly to the fall apple. We can grow more fall apples than any other place, McMahan, Wealthy, Longfield and that class of apples. I don't believe anybody can grow more. We cannot grow the better class of winter apples; we can grow the Northwestern Greening, but it is like the McMahan, it is not much good when you get it. The McMahan is a good keeping apple, so is the Northwestern Greening. Its usefulness ends there in my opinion, but its size recommends it. But if anybody wants to raise apples let them go into McMahan, Northwestern Greening and Wealthy and they can get plenty of apples and make money out of them. I don't know but this is enough to say of the McMahan, I don't want to dwell too long upon the subject. I think I have given the bare facts in the case, so far as they appeal to me, and I would recommend the McMahan apple as being one of the best apples adapted to central and northern Wisconsin.

Mr. Geo. J. Kellogg: Except to eat.

Dr. Loope: I would not like it. It has not the quality of an eating apple.

THE STATUS OF THE McMAHAN APPLE IN MONROE COUNTY.

J. J. Menn.

Mr. President, Members of the Society:

Our Secretary requested me to report on the McMahan apple for Monroe county. It gives me great pleasure to report on a variety that has in the last few years won such a wonderful reputation all over our state and even in other states of the Northwest.

Some sixteen years ago the first trees were planted in this county. These were purchased from the Baraboo Nurseries—the trees were very hardy and productive. Our cold winters don't seem to injure them; not a single tree has been winter-killed to my knowledge. It seems to thrive well on sandy loam or a stiff clay. It is a rapid grower and responds readily to fertilizers. It is not as shapely a tree in the orchard as many others, for it has many crotches.

It is slightly subject to twig blight but not enough so to injure the tree. With me it commenced to bear the fourth year after planting. Trees three years old bore a heavy crop of very large handsome apples in the alternate years. The fruit is very tender skinned and shows bruises more quickly than most other varieties, and must be handled carefully to obtain best results.

The quality is very good, if fully ripe it is a very fine eating apple and holds first place and will in the future. As a cooking variety, those who have used them once want them the second time.

Its keeping qualities for a fall apple are very good—the last week in January, 1905, at an institute I saw McMahan apples exhibited which had been kept in a common cellar on shelves spread with paper, the apples being as fresh as when picked. I consider it one of our most valuable varieties—hardiness, productiveness, size, color and quality of fruit being considered.

For a show apple it has no equal and stands at the head. This was recently proven at the St. Louis Exposition where people saw our McMahans and thousands said "Oh, what beautiful apples! Aren't they fine? Why, I never before saw such handsome fruit, etc." (And they were fine.)

Those of you who kept track of the Chicago quotations on apples last fall must have noticed that the McMahans quoted higher than any other variety, even higher than Jonathan. I look for it to hold first place as a commercial fall apple.

It was the only variety shipped to Chicago last fall from my station that netted a profit to the grower, as near as I can ascertain not over five per cent of the trees growing in this county are McMahans. I wish it was twenty-five per cent; but more will be grown from now on. I consider it one of the best varieties for our state and the man who sets an orchard of 500 trees certainly makes no mistake.

DISCUSSION.

Dr. Loope: I wish to say one word more in regard to this apple, and that is that as a cold storage apple the McMahan is a dismal failure. The first time I put it in cold storage it spoiled entirely, at least it did with me. It will keep longer without being in cold storage.

THE STATUS OF THE McMAHAN APPLE IN RACINE COUNTY.

W. J. Moyle.

This matter has been very thoroughly discussed and I don't think I can add anything that would be of value or interest. My attention was first called to the McMahan several years ago by farmers coming in the spring or fall of the year to my nursery bringing samples and asking me what it was. Years ago we had a nurseryman there, an enterprising old fellow, who got in quite a stock of varieties, and among them he had the Mc-

Mahan, and my attention was first called to that apple at that time. We are told it is of poor quality. I always let the public be the judge in a matter of that kind, the parties that eat those apples. The farmers in our country think it is a pretty good thing, and they ask if that is the tree for them to set out. But as stated here this morning, it is a late bearer, it does not come into bearing until it is of a pretty good age. I started out to say I did not recommend the McMahan in our locality because we have better apples. We grow the Fall Orange, the Fuldenwalder and apples of that description, and the McMahan will not compare with such varieties. But in other parts of the state, particularly in the northern part of Wisconsin the McMahan apple is an apple that can be grown successfully. It is a poor quality apple and in some places would not be considered at all. But it is a wonderful show apple. In that it is like the Wolf River, which is a wonderful show apple. The Wolf River has brought our state more publicity than any other apple except the Northwestern Greening. As a nurseryman I do not like to grow it because the tree is a crooked grower; it grows like the Patten's Greening, but we have to grow a few of them. In the northern part of the state where this apple can be grown commercially you will find an excellent market for it. It is an apple that will take in the market every time.

THHE STATUS OF THE McMAHAN APPLE IN WAUKESHA COUNTY.

W. H. Steele.

This question in regard to the McMahan apple has been quite thoroughly discussed. The only thing I can do is to tell of its status in Waukesha county. The first trees planted in our county were planted eighteen to twenty years ago and were introduced by Mr. Edwards. They seemed to make a good growth and were usually overloaded with fruit, yet I have not known a single tree to break down by reason of being overloaded. It is subject to twig blight to some extent, yet not to such a degree as to injure the tree materially. As far as its qualities as a market apples are concerned, I think it is somewhat tender, it will not bear much handling like some of the other varieties that we can raise, and that are far superior to the McMahan in our county, such as the Plum Cider. I think a great deal of it as a fall apple, but I think the Wolf River is ahead of the McMahan. As an orchard tree I think it is a good bearer. If you take it from the farmer's standpoint it can be recommended as a good tree to grow, for the reason that it is an upright grower and is consequently easy to work around.

Mr. H. B. Hotchkiss: How would you compare the McMahan with the Wolf River for commercial purposes, or in growing a commercial orchard?

Mr. Steele: I have not had much experience in that line, but I think there is a good demand for McMahan, better than the Wolf River, because the Wolf River has not been raised in large enough quantities to come before commercial men as a commercial apple. As a cooking apple, and I speak from our own experience, we find it good for a short time. It will not hold its form or keep very well for any length of time. The apples that are shown here are very much better than what we grow in our section. These have more the appearance of cold storage apples. I don't know whether they were kept in cold storage or not. Ours have always shriveled. There is another point, and I don't know whether it is against it, but after a tree gets to be about fifteen years old, and the oldest trees I have been able to find in our county are about twenty years old, the fruit is rather inferior in size and will not color, probably a fact due to not being pruned. As far as the McMahan apple throughout our whole county is concerned, I don't think there are many people that are grabbing for it; there are some, I know. Mr. Edwards, I think, did more to introduce it in our county than any other man, and the best that can be said about it is its size, and then it also colors nicely. It certainly is a showy apple, and for cooking it can be recommended, but as I said a few minutes ago, we have apples that we can raise in the southern tier of counties that we think are much better. This question has been so thoroughly discussed that I will not say any more for fear of going over the same ground again. I have said about all I can say so far as our county is concerned.

DISCUSSION.

The President: Are there many of the trees in your county?

Mr. Steele: No, sir, there are not. The largest orchard is that of the late Mr. Stickney. He had more than any other man in Milwaukee or our county.

Mr. J. J. Menn: What is your soil, you say it is so very productive?

Mr. Steele: It is a clay soil underlaid with limestone.

Mr. Menn: With me it is very productive; we have a clay soil with a light gravel subsoil.

Mr. Steele: I think it is over productive after it reaches the age of ten to twelve years. In fact, I think it overbears rather than underbears, but it does not come into bearing until it is seven or eight years old. That has been my experience.

Mr. A. D. Barnes: I think to do my duty I should have to recommend the McMahan for sandy soils. It is wonderfully hardy in the north, especially in sandy soil. It is a vigorous growing tree. It is an apple that sells well in our local markets, provided anyone handles it carefully. It is one of the most showy apples we have in our county, and one of the best fall market apples, and the only fault I have to find with it is that it is so delicate to the touch. It is one of the best sellers we have, and it is a tree everyone ought to tie to in a small way, especially so in a sandy soil.

Mr. W. S. Hager: I know only of a few trees of the McMahan in Brown county, but they are entirely satisfactory to those who have them, and they keep very well, at least until the 11th day of January. I tried to eat some of them and they are keeping very nicely.

Mr. A. D. Barnes: It is a very early bearer where the scions were cut from the original tree, and especially so on sandy soil.

I wrapped about a bushel of them and put them in my office cellar; I unpacked them last Sunday and nearly every one of them was perfect. I did not suppose they would keep like that, but I don't believe they will keep like that every year.

The President: They don't keep very long. I believe some years they keep pretty well in ordinary storage, and they keep better in that way than in cold storage. There is one thing I object to in reference to what Mr. Barnes said about the McMahan tree for the average man; I don't believe he wants it. He wants a better apple for his own use, but if he wants a commercial apple then let him grow the McMahan.

Mr. Geo. J. Kellogg: I believe every farmer who wants the McMahan apple wants it for cooking. It is winning its way, and the further north it is grown the better it will keep; in the southern part of the state it will not keep through October.

Mr. Webb: Is not that true of all fruit?

Mr. Geo. J. Kellogg: The further north you grow any apple the longer it will keep.

Mr. Nicolai: I want to add one more word in favor of the McMahan apple for the farmer. I think every farmer ought to have from one to three trees. In some years I don't believe there is another apple that will give as much satisfaction to the housewife when it comes to preparing it for the table. It is an excellent cooking apple and it saves a great deal of labor in its preparation because it is so large and perfect.

Mrs. Treleven: It takes us a long time to form an opinion of the apple. They are nice, thrifty looking trees, but we have not a tree from which we have yet taken a peck of apples, and they have been planted from twelve to fourteen years. I was just going to testify to what the gentleman said about saving labor for the women, and I want to put in a good word for the McMahan apple. I help to gather a good many apples, and I would rather gather large ones than small ones.

Mr. Bingham: With us the McMahan bears very young, in three or four years we get from a bushel to a bushel and a half from a tree. They bear every year.

Mr. Jos. Reek: I wish to say a word in regard to this Mc-

Mahan apple. I have traveled thousands of miles through Wisconsin and I have taken a great deal of pains to find out what the typical apple was for each particular district. When I was living on my south farm near the Illinois line, when I investigated the McMahan apple I did not think I wanted to grow it. When I came to Winnebago county I had my attention called to it and I found it could be grown to advantage. I did not make a mistake, the apple is doing well. That and the Northwestern Greening are doing well in the north, and the men that are growing those apples in the north are growing them with success. They are a credit to the country. They are adapted to that country. Apple growing is somewhat similar to strawberry growing. A certain strawberry may be a success in one section of the country, but when you go to another you find it is not adapted to that section. I believe every man who has a little land should set out apple trees. And the next thing we should do is to set out something that will bear apples. If you cannot raise the desired apple I tell you what you want. You want an apple you can hand around among the boys when they come to see you. I have set out ten trees for the boys, and you will find those boys, like our friend Moyle, almost every apple tastes good to them. I find the boys praise the McMahan more than anything else. If you have a good farm up north or anywhere else set some McMahan apple trees, and when you have the McMahan apple you will have plenty of apples for the boys. Do not miss setting a few for the boys in your district.

Mr. W. A. Toole: I just dropped in and I hear you are talking about the quality of the McMahan. I think you refer to the selling quality, and I am rather under the impression if you were to call on Mr. McClay he would know something about that point. He asked me at Clarinda where he could buy McMahan apples.

Mr. McClay (Chicago): I will say that the McMahan apple at its proper season is one of the best sellers we have, it was one of the best sellers we had this year. None brought a better price, and as much as I know of it at the present time I would recommend it for the market ahead of anything else in its season.

THE FLOWERS IN MYTH, LEGEND, AND HISTORY

Mary Alice Moyle.

The [illegible] different subjects that would each for [illegible] of this association is so many [illegible]. And then one almost doubts [illegible] in an interesting manner [illegible] The Flowers in Myth, Legend, a [illegible] I [illegible] them so, and if love fa [illegible] higher power.

[illegible] from the nursery [illegible]

[illegible] know, to see that [illegible] their sweetness [illegible] sprays of clematis [illegible] rambler. [illegible] poppy, [illegible] gladiolas, the [illegible] pansies.

[illegible] people. The [illegible]

And it struck me as interesting, that all these people's thoughts should be detracted from themselves, from me, from their surroundings, from their circumstances, by that mass of beauty in my arms.

And I wonder if there really is anyone who doesn't love flowers,—not for the sake of display, not for the sake of securing a costly collection, only; yet there is a choice in varieties, even, and better a contest of roses than one of bull-dogs; and of all fools, a floral fool deerves the eminence, as Henry Ward Beecher says.

But is there anyone who doesn't love them for their delicacy of texture, perfection of form, loveliness of hue, and sweetness of odor; for their signification of purity, innocence, sweetness and vigor; for the embodiment in them of thoughts spiritual; of memories human.

You have seen a man with a carnation always on his coat. It may not have been a rank spirit of foppism. You have seen the young woman raise the rose to her lips. It may not have been affectation. The gardner has not watched and tended and shifted this plant merely that he may make a good, saleable article. The housewife doesn't plan and plant and perfect solely that she may have a beautiful lawn. No, there is something deeper in all these. We are prone to ascribe almost human life and soul to our flowers. We must have them in abundance in times of joyous life to help us make merry, to rejoice with us; we must have them in plenteousness in times of sorrowful death. to help comfort us, to grieve with us.

We attribute characters to them. Some of the pansies are so saucy; some have such mirthful faces that you smile involuntarily to see them. Your heart goes out in sympathy to the pale blossom, o'er-shadowed and scorned by its gay rivals. You touch reverently the stately white Ascension lily. It is the virgin of the garden; never stooping, never seeing anything gross that takes place around it. The fragrance of the rose appeals to your senses as does your love of a beautiful child. You call the geranium "bon comrade" because it is ever blooming, always cheering.

The poets tell us about "The slumberous poppies," "the modest violet," "the sweet-voiced mignonette," "the faint, fair heliotrope who hangs like a bashful maid her head," and of "Miles upon miles of golden-green where the sunflowers blow in a solid glow," "the flaunting tulips," "the brief, courageous wind-flower, loveliest of the frail," "sweet peas, on tiptoe for a flight with taper fingers catching at all things to bind them all about with tiny rings." Burns has immortalized the daisy with,

"There in thy scanty mantle clad,
  Thy snowie bosom sunward spread,
Thou lifts thy unassuming head
  In humble guise."

Bryant, in mourning the death of the flowers, says,

"Till fell the frost from the clear, cold Heaven,
  As falls the plague on men,
And the brightness of their smile was gone
  From upland, glade and glen."

Flowers typify to us that invisible, that untenable, spirit-relationship which we can not seize upon but which, nevertheless, often presents itself to our view. There are ugly deeds, pitiful sights, hateful thoughts, discordant sounds, but flowers, in themselves, do not present them to us. In association with, they may. There are no unlovely flowers. Our weeds are somebody's rarest flowers and are beautiful in design, if only examined. Because they are "common" only enhances their value, for they can be enjoyed by all classes. They recognize the great democratic spirit of mankind, springing bright and joyous from the velvet sward of a "Vanderbilt," or on the dusty road-side of a "Weary Willie." They always express regard, esteem, affection. They may be given and received by the high, the lowly. They are never obtrusive.

Don't you remember what pretty tints of purple, red and green the burdock burs had when you used to fashion them into parlor furniture for the home you were going to build, while the cattle strayed away into the corn? Will you ever be more nobly or more worthily garlanded or begemmed than when you wore neck-lancer, chains and bracelets of the lilac flower, white and purple, festooned together with wish grasses?

If you should plant a thistle in your garden, care for it assiduously, and tell the ignorant ones who admired its ornate, rich green leaves and elusively delicate flower that it was Cersium lanceolatum, they would be impressed, I know.

As for the dandelion, I have always admired it. I love the first flower that appears and the last one that goes. Once, when but a young girl, I took a trip to Milwaukee. I was among comparative strangers and in new fields. The noise, the hurry, the unaccustomed sights, all combined to make me, oh, so homesick! Suddenly, we whizzed past a vacant lot which was verily a sheet of yellow. I remember yet the thrill that went over me at the sight of those dandelions. I longed to get right in the midst of them. That night as I lay awake, wondering at the ceaseless traffic in the streets, the strange surroundings, my thoughts reverted to those friendly, familiar flowers, and I doubt not, but that if anything had happened to have frightened me out of my childish wits, I should have fled straight to the dandelion patch.

When we consider the glamor of romance and sentiment with which we of this pre-eminently practical age do invest the flowers, it is not difficult to account for the myths, legends and historical allusions concerning them. Going back almost to the beginning of the written history of the world the character of that personage whose teachings and influence has had most to do with our appreciation and love of what-so-ever is beautiful, pure and of good report, could not be more fittingly expressed than in these words, "I am the *rose* of Sharon and the *lily* of the valley." And the perfections of these creations of the Great Father totally eclipsed Solomon in all the glory of his Oriental splendor.

The primitive peoples had minds, as we have. They were confronted with the same scientifically unanswerable questions as we are. "From whence does life come?" "Why are we given this boon only to lose it?" "Does death end all?" They strove to read the answers in their surroundings and what they could not understand they imagined, as we do.

They could not conceive of a soul whose flight was higher than that of natural phenomena, and so they attributed supernatural might to those objects of nature that seemed more powerful than they, as we do not. To them the moon was a huntress, coursing through the upper ether, the clouds were swan maidens flitting across the firmament, the sun a yellow-haired god in a chariot of fire who swam nightly through the subterranean waters to appear eastward, again, at daybreak.

To them a sunflower was Clytie who in her ocean home had heard of and longed to see the great light that shone upon the waters. One day when riding behind her turtles she fell asleep and was carried to the surface. As she looked away to the east she saw the light appearing and in its midst in a golden chariot sat a wonderful king at whose smile the birds began to sing, the buds and leaves to unfold, the waters to sparkle. Clytie sat on the rock all day long and wished she might become like the great kind king. Day after day she returned with her desire unquenched till one evening as she looked into the mirroring waters she beheld a face very similar to that of the great sun-god she loved. Her golden hair had become yellow petals, her green lace dress had turned into leaves and stems and her little feet had become roots which fastened her to the ground. And now we find her in many lands always turning on her stem to follow the course of the sun.

This same god, Apollo, was very fond of a youth named Hyacinthus. Together they hunted, sported and rested. One day when playing quoits, Apollo hurled the discus with such strength and skill that it struck Hyacinthus who, in eagerness, had rushed forward to seize it. The lad fell instantly, mortally wounded. In great regret Apollo declared that his name should be celebrated in song and story and from the blood flowing on the ground sprang a flower, in hue more beautiful than the Tyrian purple. Every returning spring revives the memory of this much-loved, unfortunate boy in the sweet fragrance and lovely bloom of the hyacinth.

You are familiar with the narcissus. It commemorates the memory of a youth of such fascinating personality that the nymphs all loved him, but he fled them only to fall in love with his own image as he knelt to drink at a crystal stream. Thenceforth, he neglected the hunt, his dog, and even food that he might gaze at the alluring figure in the water. At his death, when the mourning nymphs would have taken his body they found nothing but a fragrant flower where he was wont to recline. It is said that when his shade passed the Stygian river it leaned over the boat to catch a look of itself in the water. Thus to them was every plant or tree a god or goddess in disguise.

Dryope, the lotus, Adonis, the rose, Pyramus and Thisbe whose blood stained the mulberries from white to purple.

I had often wondered where the mistletoe obtained the license it flaunts at the Yuletide. It seems that Balder, the dearest son of Odin, the Norsemen's supreme God, had a premonition that he was to die. So Frigga, his mother, exacted an oath from all existing things that thev would not harm Balder who brought spring, sunshine and gladness. She neglected to ask the mistletoe because she thought it so insignificant. Loki, an imp of deviltry, found this out and through his efforts a sprig of the little white-berried plant was thrown at Balder who instantly succumbed. Doubtful tradition tells us that Frigga in her grief ordained that the mistletoe should be hung up and all passing thereunder should receive a kiss of forgiveness to show that she cherished no resentment. The custom of hanging up the greens and the holly descended to us from the Druids who decked their houses thus so that the sylvan spirits might repair thereto and abide the winter.

About the prettiest of the German legends runs thus: A knight and his lady were walking along the banks of the beautiful Danube river. She saw a little blue flower at the edge of the stream and asked the knight to get it for her. In doing so he slipped and fell into the river whose strong current bore him, hampered in heavy armor, away so that he never reached the bank again. But he threw the flower to his lady-love and cried with his last breath, "Forget-me-not."

And then again they tell us that when the first little snowdrop pushed up through the ground it felt so bad to see such a cold sky and no other flowers out that it dropped its head and looked down at the snow from whence it sprung. And the snow sparkled back so brightly that it cared to look at nothing else thereafter and so became named "snow-drop."

Many a flower, shrub or plant has become dear to and emblematic of a nation. You who delight in the "wearing of the green" and talk about your shamrocks and shillalahs of course know how when St. Patrick landed in Ireland and attempted to convert the natives to Christianity he found serious trouble in explaining the Trinity. Plucking a three leafed grass with one stalk, he exclaimed, "Is it not as possible for the Father, Son and Holy Ghost to be in one as for these three leaves to grow upon a single stalk?" Tradition says that the Irish were immediately convinced and solemnly baptized.

Switzerland is known the world over for its edelweiss. There, only in the highest, roughest, most inaccessible clefts of the Alps does this plant bloom amidst eternal snows. Life after life has been offered up for it, not for the special exquisiteness of the specimen but because the risk of securing it presented to tourists rare opportunity for ambitious courage and daring effort. It is the national betrothal flower, the evidence of the lover's strength, fearlessness and willingness. Now that florists are succeeding in growing it in American gardens it takes all the romance out of it.

Somewhere, sometime, I have heard a story concerning the thistle of Scotland. How when the invaders were stealing up in a night attack one of the soldiers stepped on a prickly thing that caused him to cry out, thereby waking the sleeping, unsuspecting guard who roused the defenders in time to turn back the foe.

One of the brightest spots in the history of France is that illumined by the lily-bordered banner of Joan the Maid. This girl in her teens, protectress of king and armies, yet herself doomed to cruel and ignominious torture and death. Through two short years of triumphs, honors and feastings, to be succeeded by fears, taunts and abuses. When her inquisitors asked her which she loved more, her banner or her sword, it was her banner forty times better. Through all the happenings of that eventful two years it was at her side, in her victorious conflicts, when the ungrateful Dauphin was crowned, in her felon's cell. I believe those lilies were dear to Joan. Maybe some like them grew in the fields at Domremy, the valley of many colors. Perchance, she had tended similar ones in her garden at home; to her they reflected the purity and innocence of her own mind. Perhaps, she had copied them from the sacred painting in the chapel. Howe'er it may have been those lilies ne'er had occasion to blush for their association. How satisfying it would be if we could say that the lily, fleur-de-lis, became the national emblem of France, dating from this epoch in her history. But facts will not bear us out here as just how and when the fleur-de-lis came into prominence is not known.

You will often see Queen Wilhelmina's photo embellished with tulips. This flower is not a native of Holland, being introduced thereto in the 16th century from countries of Asia. Though the first Antwerp merchant to whom the bulbs were consigned ate them for onions, there soon grew a great demand for the early blossoms. At one time there existed such a craze and traffic in the exceedingly beautiful ones that it was dubbed tulip-mania by the outside world. The "Low Countries" found that their soil, wrested from the clutch of the ocean, was admirably adapted to the culture of flowering bulbs. So a trade sprang up therein which has added immensely to the prosperity and pleasure of the Lowlanders. And so they nationalize the tulip. I think that the flower and people have similar characteristics, both being sturdy, hardy with stolidity the background. The flowers stand out in a glare of solid color with no attempt to deviate from their preciseness; the people, likewise, stand out unflinchingly, unwavering in their own precise individuality.

Then there is the lotus of Egypt, the chrysanthemum of Japan, the rose of England, which gave the name to a war of many years' standing till the dispute of the Roses was settled by the union of the two factions through marriage.

The United States is without a floral emblem. But the question has been agitated and is now receiving attention. It takes ages to produce *rare, old* china. The wine bottles festooned with cobwebs and covered with the accumulated dust of years give promise of the mellowest drink, so they say. The oldest countries are the most enveloped in legend, romance and sentiment. The United States is still young and crude. To her is clinging only the spirit of progress and present day achievement. She has not as yet reached that haven of secure rest and had time to look back on her early struggles in that spirit which enwraps all that once seemingly unendurable pain, labor and bitter experience in a mist of affection and regret. She is not yet ready for sentiment. But the farmers in a National Grange Convention came to the front with the suggestion that the Indian Corn is most deserving of the respect, love and homage of the American people. They might advance the following arguments: It meant *life* to the first settlers here in their stress for food. It was a mainstay to the shifting Indian population and the object to them of feasts and religious festivals. It meant wealth to the industrious planters in those early days. It goes, hand in glove, with the American hog to lift the mortgages off the homes in the great Central Plain. It has warmed the hearths of the shivering settlers in our Western States. It has furnished hominy and corn pone to go with the 'possum. From some secluded, dark, out-of-the-way mountain side its breath has gone up in a thin, curl of smoke and its substance has been distilled, but not in the dew and the rain. It has furnished the basis of husking bees innumerable, with their accompaniment of "red ears." It has bowed before the storm like a mighty army and all of Nature's secrets rustle among its leaves. It has waved its green ribbons in the breeze and they flutter like pennons on a man-of-war. Whittier saye of it:

"Heap high the farmer's wintry hoard, heap high the golden
corn!
No richer gift has Autumn poured from out her lavish horn,
Let other lands exulting glean the apple from the pine,
The orange from its glossy green, the cluster from the vine.
But let the good old corn adorn the hills our fathers trod;
Still let us for his golden corn send up our thanks to God!"

There is no doubt but that the Indian corn is rife with sentiment and as intimately connected with our national life as anything can well be.

You have probably read the "Mill on the Floss." You will recall how Maggie and her little friend loved to "suppose" things. I imagine how they would say, "See that lady-bug. She hurrying for she sees smoke and thinks maybe it is her house. "This mother ant has found a grain of wheat and she is so anxious to get it to her children because they have had nothing to eat for a long time." "The butterflies are having a picnic today and they are all on the floor for a waltz." But Tom Tulliver, lying there on the soft grass would look up with a scowl and say, "Fudge! that ain't so. They're only beasts." And rising he would crush them with his ugly boot or knock them down with his cap.

Well,—all I ask is that *you* be not Tom and stamp or knock all our pretty conceits into the grit of plain practicality.

DISCUSSION.

Mr. Geo. J. Kellogg: I am surprised that the young lady is not married. (Laughter and applause.) I wish I was a young man again. I realize now why my boy is married, he married into that family. I am not surprised we got so good a paper, and I am glad it came after we got through with our apple sauce.

MARKET GARDENING.

Delbert Utter.

I will say after the subject that has been presented this will perhaps seem too practical, for market gardening is surely a long way from flowers, and there is a lack of interest in market gardening as there is in flower culture, as almost everybody here is either an apple or a strawberry grower.

As land becomes more valuable, some system of intensive culture must be adopted if an income commensurate to the capital invested, be obtained. The cost of living and of labor has increased twenty-five per cent during the last decade and as a consequence higher priced crops must be grown on fewer acres.

Market gardening offers one form of profitable farming and may be made as intensive as location and quality of soil will warrant. Success depends upon locating near a good market or where shipping facilities are such that prompt and rapid service can be depended upon and where manure can be delivered cheaply.

The general market gardener must grow a large variety of vegetables that must be delivered in the best condition, many of them being perishable, therefore he must have a nearby market and should have a regular supply to be able to command a trade, that will give regular customers that will pay the highest prices. There is seldom enough of the best products in any market and nearly always too much of the poorest.

There are specialists amongst gardeners as well as there are in other occupations and they are usually the most successful. They have become adepts in growing some one or more crops by learning the necessary conditions that will produce the largest crops and at the same time will be of the highest quality. The factors needed for these special crops are suitable soil, abundance of fertility, the very best strain of seed, and a man who can use these factors to produce a better product than his competitors and sell it to the dealer that is willing to pay for the best.

It is often said that any fertile soil will produce good garden crops. This may be good advice as far as the family garden is concerned, but the success of the market gardener depends upon having a soil adapted to the crops grown. There are more failures caused by bad selection of soil than by all other causes combined. For early vegetables and for melons and tomatoes a sandy loam with a porous subsoil and that underlaid with a bed of clay at a depth of five or six feet is an ideal soil. Perfect drainage is provided and surplus moisture is held at a level that can be drawn upon by capillary action at such times as the rainfall is insufficient for proper growth. With an abundance of manure to provide humus as well as the necessary elements of fertility, we have a soil which when handled with intelligence will be in the very best condition to make use of the food, moisture, heat and air that work together to produce a good crop. For the late crops and for cabbage, cauliflower and celery a dark colored loam soil as deep as can be found with clay subsoil should be selected.

Much of the reclaimed swamp land make the very best place to grow the crops mentioned. When we say place to grow vegetables, we particularly mean that the physical conditions are good as when well drained this soil is capable of conserving the proper amount of moisture and when well cultivated will admit the needed heat and will grow vegetables that are of good form, as soil is equally mellow and friable the whole season. It is simply a place, for the reason that the soil was formed from the coarsest kinds of vegetation that contained very little nitrogen and less of the mineral elements of fertility. All of these elements of fertility must be applied and in sufficient quantity to grow maximum crops.

All soils with a retentive subsoil should be tile drained and the work should be most perfectly planned and executed. Should water stand a few hours on the land a season's crop may be lost. Soil that is well drained will allow the heat and air to penetrate to a greater depth and will withstand drought better than one that is not.

The proper texture of the soil is of more importance than is generally realized. By disking ground before plowing thereby mixing manure thoroughly with the soil then plowing as deep as the nature of the soil will admit, following with leveller, disk, roller and smoothing harrow, until soil is in the finest tilth and that firm that a horse will sink to half the depth of his hoofs, the ground should be in the best possible condition. This thorough preparation makes a seed bed that insures conditions favorable to perfect germination of seed and for the best root development.

While we may apply a most liberal amount of fertility in the form of manure, yet, early in the season, before there is enough heat to unlock and make available the elements of fertility that are in the soil, the plants make little growth, and an application of some form of soluble nitrogen may be needed to give the plants a good start. Nitrate of soda used at this period at the rate of one hundred and fifty to two hundred pounds to the acre, will prove to be very beneficial. Then again, potash very often can be used profitably for crops that take a large amount of that element of fertility at certain stages of their growth. The only successful market gardener is the one who keeps his soil supplied with an abundance of plant food.

The very best seed should be secured, growing and saving the varieties that mature perfectly on our own grounds and purchasing from dealers and growers that have a reputation for reliability. It is best to know where the best seeds are grown and buy of the grower when possible. No gardener should risk his crop without testing his seed unless he has implicit confidence in the source from which it came. Seeds of all vine crops are better if not used until the second or third season after saving and such seed can be tried for quality by purchasing enough for two seasons and planting a part of the crop from new seed and noting results. The price of the seed is of the least importance, yet a high priced seed does not signify good quality. A single pound of seed sometimes produces a thousand dollars' worth of produce, consequently it means everything to have the best seed.

Varieties should be chosen according to the demand of the markets in which we sell our products, at the same time considering their adaptability to our soil and yielding capacity. It is better to cater to the tastes of our customers than to try to educate their tastes to the kinds we think are best.

While no list of varieties can be recommended for all markets and all localities, there are standard varieties that yield well and are popular in most markets. A partial list is given here that have proven to be good in my own gardens or in the gardens of growers with whom I am acquainted.

Asparagus: Palmetto and Early Argenteuil.

Bush Beans: Golden Wax, Currie's Rust Proof Wax, Stringless Green Pod, Refugee.

Limas: Siebert's Early, for pole, Thorburn's Bush Lima.

Cabbage: Early Jersey Wakefield, Premium Flat Dutch, Mammoth Rock Red, Danish Ball Head.

Beets: Egyptian, Early Blood Turnip, Eclipse.

Cauliflower: Extra Early Erfurt, Early Snowball.

Carrots: Half Short Oxheart, Half Long Danvers.

Celery: Improved White Plume, Golden Self-blanching, Giant Golden Heart.

Sweet Corn: Mammoth White Cory, Premo, Country Gentleman, Chicago Market, Crosby, Early Evergreen, Stowel's Evergreen.

Cucumber: White Spine, Improved Long Green.

Egg Plant: New York, Early Dwarf Purple.

Lettuce: Improved Hanson, Grand Rapids, Deacon, New York.

Musk Melon: Emerald Gem, Rocky Ford, Osage, Tip Top.

Water Melon: Phiney's Early, Kolb's Gem, Early Jumbo.

Onion: White: Early Barletta; Yellow: Globe Danvers; Red: Large Wethersfield, Large Globe.

Peas: Extra Early Alaska, Gradus, Nott's Excelsior, Telephone, Juno, Market Master.

Potatoes: Early Ohio, Rural New Yorker, Carman.

Squash: Giant Golden Summer Crookneck, Hubbard.

Turnip: Early Milan Purple-Crown, Red Top Globe-Shaped, Purple Top White Globe.

Tomato: Beauty, Dwarf Stone, Dwarf Champion.

Radish: Early Scarlet Globe, Early Scarlet Olive Shaped, Improved Chartier.

The Wisconsin grower has no Northern market to ship to and has the southern stuff to compete with during the whole season, but late in the season the southern market draws on the northern grower for potatoes, onions, cabbage, celery and cauliflower. There are many localities where there is land well adapted for these crops and if good shipping facilities can be obtained for shipment of produce and a supply of manure at a fair rate, success is assured to the man with good business ability and a practical knowledge of growing the crops.

Three varieties of crops, choosing those with separated periods of planting and harvesting, makes a combination that will prove profitable. One of the three should prove very profitable and two out of the three should be profitable and we can afford to grow one and sell it at cost. Early potatoes, onions and cabbage are being grown in combination in the south-eastern part of the state very profitably. In 1903 the cabbage crop brought very high prices and onions made a good profit. In 1904 the early potatoes and onions sold at good prices and while cabbage was very cheap, there was a fair profit.

Manure is procured from the Chicago Stock Yards and Chicago stables, many hundred of cars being used and in addition to this, many cars of chemical fertilizers are used.

Celery and cauliflower are usually grown by men who have learned how to handle these crops and are specialists. They require close attention to details both as to culture and preparing for market. A deep, moist, black loam soil is needed for these crops; it must be well drained and a liberal amount of manure supplied and well mixed with the soil. Frequent and thorough cultivation is most necessary, particularly after each rain, to conserve the moisture and encourage rapid growth.

The early stuff in our home market is what makes the most profit and every effort should be made to forward the crop. This is accomplished by preparing the soil in the best possible manner, using good seed and cultivating the crop thoroughly at every stage of its growth. Many crops can be forwarded by starting plants in greenhouse or hot bed; these plants should be transplanted several times and well hardened before planting in the open ground.

Cantaloupe and all vine crops can be forwarded two to three weeks by starting them in sods or plant boxes. I have been successful in using sods placed on a fresh made hot bed the first of May and removing to the field in five to six weeks. A blue grass sod that is of a sandy or loamy texture and well enriched by top dressing with manure the year previous, is best.

The texture of the sod pieces has much to do with the success of this method as roots will not penetrate through a clay sod. The hot bed is made from stable refuse with a large proportion of litter, this mixed thoroughly and moistened so that it can be tramped firmly and evenly in a bed six feet wide and of any desired length. When finished the bed is about a foot deep. The sods are cut three inches thick, ten inches wide and seventeen inches long, to fit the bed and when placed should be perfectly level. The sods are then cut to about five by six inches and five or six seeds are planted in the center of each piece using a knife to make a hole for the seed.

As soon as the seeds are planted glass is put on and the bed is allowed to heat up to 100 degrees during the day and should not drop below 60 degrees at night. When plants are up, which will be in about four days, sash are raised during the hottest part of the day. If half cloth sash are used there is less danger of injury from too much heat. The cloth should be treated with a coating made of boiled linseed oil and eggs, using two eggs to each pint of oil and mixed thoroughly.

When the plants are well grown, thin to four plants; after the fourth week the plants should be gradually hardened off and when weather conditions will warrant transplanted to the field. The pieces of sod should be saturated with water before transplanting, thus enabling them to withstand a period of drought.

The ground should be plowed early in the spring and disked and harrowed several times at intervals of a week or ten days, with this preparation the soil should be in the finest tilth. Make the rows six feet each way and place sod pieces so they will be covered an inch deeper than the thickness of sod.

There has been as great improvement in tools for the gardener as for the farmer with the exception that the gardener usually walks. The first requisite in a tool is that with it perfect work can be performed, not that it has a comfortable seat and canopy top.

The seeders and planters are easily adjusted to use the required amount of seed, dropping it at an even depth and firming the soil so that rapid and perfect germination may be expected. The plow should throw the soil and mix it, in place of turning over completely. The disk harrow is the most important tool for the preparation of the soil for a crop. It is a pulverizer and a mixer, working the soil into the proper condition for good germination and by mixing the manure thoroughly, the plant food is prepared for the use of the young plants.

The leveller, roller and smoothing harrow are used as finishers and the harrow and horse weeder are used to kill the weeds and form a dust mulch—on crops that will stand the treatment—after planting and until the plants have made considerable growth. As to how much and how long the weeder may be used depends on condition of soil and plants. We follow the cultivator with the weeder, this levels the ground and breaks up the space left by the cultivator. Success in using this tool depends on using it before weeds have made their appearance above ground. The cultivator is the tool that kills the weeds, mellows the soil and too many times destroys the roots of the growing plants.

A steel frame horse cultivator with seven teeth one and a fourth inches wide, to be used when plants are small, with adjustment for gauging depth, does excellent work. There are hoe attachments and sweeps which are used later in the season; shallow and thorough work is assured if tool is in hands of competent man. The proper adjustment of these tools has much to do with their efficiency.

The smaller tools consisting of wheel hoe, rake and hand hoes with horse and hand markers make up about all the tools required except special tools for special crops. Less work is performed with the hand hoe than formerly, yet it has its place and it should be kept bright and sharp.

The most important part of the work is the harvesting and marketing the crop. Many of these crops are perishable and must be prepared for market and sold just as soon as they are fit; enough help must be secured to keep up with the work so that no over-ripe stock will be left on our hands.

In delivering to a nearby market return crates may be used, but much of our produce is sold in gift packages and it is best to use such style of crates as are most popular in the market to which we ship. Our name on crates should be a trade mark that means good quality, just as good at the bottom as at the top. Some growers place a card in the package in such position as to be easily seen and it reads, "U see one U see all." It would be well if always true. It costs time and money to acquire a reputation for fair dealing and after once acquired it pays to live up to it.

The market must be watched and advantage taken of any demand that may be caused by shortage of supplies owing to unfavorable weather conditions, short crops in other markets or other reasons that may make better prices and more ready sale. Often one day gained in getting there before the other fellow makes a nice little profit. It pays to use the telephone, postage stamps and every other means within our reach to keep posted.

Blight and insect pests keep the gardener on the edge of despair, for after the expense of growing a crop until nearly ready for market, and then see it destroyed is to say the least just a little discouraging. Each year we get an addition to our long list of troubles and without having learned how to overcome the old ones. With all the experiments with sprays and insecticides, with scores of bulletins written upon these subjects, the gardener has not gained much during the last decade that is new to aid him. The orchardist has fared better as spraying is his salvation.

For the insects and worms that eat, we can feed them Paris green and I know of nothing better. The suckers, and we find as many of them in the garden as the real estate and mining stock agents do when they cultivate the acquaintance of the "e z marks,' can only be scared off, you cannot kill them; make them uncomfortable by tangling their legs with land plaster, road dust or coal ashes. Something like sulphur, tobacco or kerosene, that has a disagreeable odor, will also hinder their ravages. Carbon bisulphid is being used to exterminate the worms and insects that work underground, destroying the plants by feeding upon the roots.

The remedies recommended for blight and fungus diseases contain copper sulphate in combination with quicklime, ammonia or caustic soda and are used to protect the plant from the attack of the various diseases. It must be applied as a preventitive and foliage must be kept covered continually. This means eternal vigilance and the time may be near when it will be as necessary for the gardener to spray as thoroughly as does the successful orchardist at the present time.

It may be best to experiment in a small way so as to become familiar with the methods of mixing and applying these fungicides and watch results.

From my own experience and from what I have learned from the experience of others, I believe much may be accomplished to prevent the ravages of these pests by practicing a regular rotation of crops, using all the fertility possible, using only the best seed and strongest plants and give the very best culture. The weakest plants as well as the weakest and badly nourished members of the animal kingdom are usually the first to succumb to the ravages of disease.

After all has been said about the prerequisites of right kind of soil, favorable location, good seed and best methods of culture, success depends largely upon the man. He must be a business man for he must be alive to take advantage of every opportunity possible to increase his sales, by correspondence, use of telephone and personal inquiry, he is able to place his products where he will receive the best price.

He must be able to handle men, for he must employ many of them and the proper management of labor is very essential. He needs to be a hustler for his crops must be marketed at the right time and at the right place and to customers who will expect prompt delivery and in good condition. Regular customers can only be held by fair dealing, regular delivery of the best that can be grown, put up in an attractive manner and so good that their customers will think there is no other grower that can furnish products of quite as good quality.

DISCUSSION.

Mr. C. L. Richardson: I would like to ask Mr. Utter in regard to potash, how much he uses on a few of the leading vegetables, so as to give us an idea in the line of vegetables, and also something about the sulphide treatment he uses for underground insects.

Mr. Utter: We use nitrate of soda to start an early growth, and we use from 150 to 200 lbs. per acre. The potash we use for the later growth, and for that purpose we use from 300 to 400 lbs. per acre. In regard to this sulphide treatment, I have not used it generally. It is mostly used in cold frames. It is forced into the ground and the gases that form kill all the worms and lice that may be in the ground. Evaporation is very rapid, especially in sandy ground, but in clay ground it is less so, and it is claimed it is successfully used against all underground insects.

Mr. Richardson: Can you use it against the red lice that we find in the summer?

Mr. Utter: Anything that is in the ground.

Mr. Everett: My house was full of large ants and I used this sulphide and the ants have almost disappeared.

Mr. Utter: It can be used on the surface by covering it. You can kill out ants that are in a hill by putting it on the ground, covering it with a blanket or whatever would be preferable to use.

Mr. W. A. Toole: Would it not be well to caution people against its inflammable character?

Mr. Utter: It is dangerous to breathe the fumes, but I did not know it was inflammable.

Mr. Toole: It is highly inflammable.

Mr. Utter: It is also used to kill vermin in grain. It is a heavy gas and if it is spread on top of anything it will settle through. If you put it in a woodchuck hole it will go down in the hole and kill the woodchuck.

Mr. Lugger: It is very explosive and when we have ants in the lawn we usually blow them up.

Mr. Utter: That would not be necessary because the gas would kill them.

Mr. Toole: You say you partially use cloth over those beds, would you alternate between cloth and glass?

Mr. Utter: We change every day, and after it gets warmer we use cloth altogether and harden the plants gradually.

Mr. Coe: Do you use the cloth the same way you do the sash?

Mr. Utter: Yes, you draw it very tightly; if it is drawn tightly over the frame it will keep its shape.

Mr. Toole: We find those cloth coverings are a wonderful protection against frost. To me they seem to be as good a protection as glass. I usually use them for shade also.

Mr. Utter: I want to say that farmers can make a hotbed by using this cloth where they otherwise could not on account of the expense for the glass. They can make a pretty fair hotbed by using this muslin and having bottom heat.

Mr. Sam Running: I would like to ask whether anything ever came out of what was stated in the paper, that a fungus had been found with which a plant could be inoculated and which would increase its growth to a great extent. It is put out by the Department of Agriculture which has experimented with it.

Mr. Utter: The only inoculation is by tubercles to start the nitrogen and start the roots to grow in peas, beans and lentils.

Mr. Running: That is what I mean.

Mr. Utter: I never had any experience with it. There is no question that there is land which is deficient in those tubercles, and peas and beans do not grow well until the land has become infected, until the land has been treated with a great deal of nitrogen. At the national irrigation congress at El Paso it was stated that in new localities it was not necessary to inoculate the land because the soil already contains sufficient nitrogen. It is an experiment that has been carried on by the department and after it has been perfected a little more we may expect great results. It has been used in the growth of alfalfa.

Mr. H. G. Street (Ill.): You can get the same bacteria in the common sweet clover that grows along the roadside; you can get it from clover or other leguminous plants.

Mr. Utter: They have noted that result where they had other grains in the west where they plowed them up, but where the ground was well filed with fertility, there was so much nitrogen that tubercles would form at the roots of the alfalfa, and the soil was so filled with nitrogen that there was no necessity of inoculating it.

Mr. H. G. Street: I have about three acres of strawberries I would like to plow down. Is there any leguminous crop I can plow down that would be of benefit to the land? I want to put the land in potatoes.

Mr. Utter: I don't know of any. I think you are as badly located as we are. I think in the northern part of the State they can grow peas any time of the year, in the southern part it is impossible. I don't know of any crop of that kind, but perhaps someone else may know.

Mr. Irving Smith: Would not a crop of turnips do well? They grow rapidly and I know parties who raise turnips for the express purpose of plowing them under.

Mr. Utter: I think it might act as a cover crop. I never sow oats for a cover crop and I don't like rye. I find crimson clover very good for a cover crop. But sowing crimson clover at that time of the year the winter would kill it and you would get small benefit from it. I know it has ben tried in orchards with considerable success.

Mr. Irving Smith: I tried that and I did not have any success.

Mr. Jos. Reek: What would be the objection to sowing mammoth clover?

Mr. Utter: We would get no growth.

Mr. Reek: I got a good growth, but I sow it as early as I can. I have sown mammoth clover in my corn and it made a big paying investment in the production of the next crop of wheat. I have made thirty to thirty-five bushels to the acre.

Mr. Utter: July is a very drouthy month for the sowing of clover, and corn will barely aid it.

Mr. Reek: There is generally a moist time in May or July and if drouth comes I use more seed.

Mr. Geo. J. Kellogg: Have you ever tried to sow corn?

Mr. Utter: No, I have not. I plant corn and cultivate it.

Mr. Nicolai: I have raised corn the last five years on my old strawberry beds and have had large crops. I never plow it in and for enriching the ground it is a good paying crop. I have had it so that the corn would glaze because the ground was in such condition in this sandy soil that the crop would grow quick, and while in the last two years the corn did not form large ears, it got almost ripe and made good fodder and made good corn to put in the silo.

Mr. Coe: The gentleman wants something that will add nitrogen to his soil and something that will add humus to his soil. He can add a great many things that will furnish humus, such as straw, dry leaves and things of that kind which he can put on during the winter and which add humus to the soil. I suggest he try that.

Mr. W. S. Hager: In regard to sowing clover for nitrogen, would clover sown after the first of July make a large enough growth so it would add nitrogen to the soil? Does not clover have to attain a certain growth before it adds nitrogen?

Mr. Hale: I don't think mammoth clover will answer, but crimson clover will do.

Mr. Utter: The question was what time the clover forms the tubercles on the roots.

Professor Whitson: The growth is most frequent in the early stages of the plant, so that if it is sown in midsummer and forms a root system it will add as much nitrogen at that time as any other time. The ordinary red clover makes its best growth and adds its nitrogen chiefly about that time, but those used for cover crops will add as much nitrogen then as at any other season.

Mr. Reek: Has it been decided that any plant is better than clover for introducing nitrogen into the soil?

Mr. Utter: I don't know of any plant that is any better than clover. Alfalfa, where it develops a deep root system, develops a good deal more, but it would not be so well adapted for a cover crop. I have not studied that question: it is entirely outside of my work.

Mr. Nicolai: I think there is no question in general that is of more importance to the farmer than this matter of a cover crop. We lose not only the weeds growing up, but there is also a loss of nitrogen, especially in our highly fertilized soils, and especially during the months of July, August, and the first part of September there is a great deal of loss. The peas would be a very good thing if they could be grown in the southern part of the State. If they were plowed under perhaps they would do better. I would like to inquire whether anyone has ever had any experience in plowing under peas.

Professor Sandsten: Peas sown at that time come up all right, but they mildew. We could plow them in all right, but they would not be practical for a cover crop at that time.

Mr. Bingham: I have had some experience with peas after a strawberry crop. Some years I get them to grow up very high, we had them grow very rank in September, but in order years they do not do so well. I think the Scotch peas are the best.

Mr. Utter With the kind of peas we grow that is an excellent crop.

Mr. C. L. Richardson: In the neighborhood of Chippewa Falls we have a canning factory, and this year I passed very frequently quite large fields that were plowed in the early part of August, and the peas were ripened to a considerable extent. The field was literally drilled with peas, and they came up and made a growth of four, five or eight inches in height; they were very thick and it gave the field a decidedly green appearance, and it seems to me there must have been some value in that crop.

Mr. Palmer: I mulched one winter with clover straw and by the time the strawberries were ripe the clover was thick as hair on a dog and stood two feet high. I thought if someone would scatter clover seed early in the spring he would get a stand of clover after the strawberry crop was taken off.

Mr. Reek: Can we keep up the productiveness of our soil without red clover?

Mr. Utter: We don't want any rotation for the market gardener. No such thing comes up in market gardening as a cover crop or rotation of garden crops. For garden purposes we must use the land for the same purpose year after year.

Mr. Hale: In our peach orchards in Michigan we have come to use oats for cover crops, and we sow oats in our strawberry beds, and we use crimson clover very successfully.

EXHIBITING AND JUDGING FRUITS AT COUNTY FAIRS.

Wm. Toole.

In any competitive exhibit of fruit three important factors are required to make it a success,—the concern which invites the contribution of exhibits, the exhibitor and the judge, and there can be no satisfactory result, unless each party to the agreement carries out in full the duties assumed.

The best conditions possible under the circumstances, should be provided for the exhibits. Flat table surfaces, not too much elevated, should be provided on which to display the fruit, avoiding, whenever possible, elevated side shelves, which in some cases are suitable for plants but never for fruit displays. Uniform conditions as nearly as possible, should be furnished all of the exhibitors, and if some must make showing along the walls where there are sidelights, the windows should be curtained to soften the glaring effect. I have in mind where a premium was offered for "best display of fruit of all kinds." Two exhibitors had the advantage of a flat surface on which to arrange their collections; another competitor's fruit was shown along the wall on an old fashioned step ladder arrangement, broken up by uncurtained windows. To some who had viewed the exhibits as spectators, and not with the critical examination of judges, it was a matter of surprise that the last mentioned lot was awarded the first premium.

Reasonably convenient plates should be furnished on which to display the fruit, such as can be handled and moved with one hand. Fruit shows on earthen plates, better than any other, but tin plates, if kept painted, answer very well. At one fair I know of, they furnished paper and wooden butter dishes. The paper kind doubles together, and the wooden ones go to pieces. It should be taken for granted, unless otherwise implied or stated in the premium offerings, that the fruit exhibited must have been grown by the exhibitor, but judging from complaints and charges often made, this rule is frequently broken, even when distinctly stated. Whenever there are any contentions or charges made in this regard, the matter should be adjusted by the superintendent and not by the judge. The judge's duties are to pass on exhibits only, and not on exhibitors.

Rules in regard to the placing of the exhibits or the purpose of the awards, should be made plain and ample. The rule for a certain number or quantity of fruit to a plate should be made positive. It is unreasonable to require a judge to make selection of three or four apples as may be required, from each of a number of over filled plates, where there is scarcely room for the plates of fruit which are to be passed upon. After a half day or more of close application in comparing exhibits, a judge will realize that there should be a careful saving of nerve force. For this same reason and another, the judge ought not be required to hunt up plates or collections of fruit to be compared.

The word "best" should be used by the compiler of the premium list in a definite way, and not be made to cover hardness, quality of fruit, adaptation, long keeping, beauty, and all other desirable qualities to be thought of. I have known of an exhibitor being disappointed because his fruit had not been tasted by the judges, believing that best, meant quality of fruit if it meant anything.

We must all agree that the leading thought of a competitive fruit show, should be to promote the production of better fruit, and when there is a general understanding of what is the standard required, then there will be less complaint, about the awards of judges. Freedom from blemishes should always be considered before size, and the injuries from codling moth, and scab, should be specially scored against.

Abnormal size, much beyond what is typical of the variety, should not be favored unless size is specially called for. Uniform size of fruit on the same plate is desirable, and such coloring of fruit as may show best judgment in time of picking, should count in favor. Many persons seem to think that size of fruit in exhibits is of paramount importance, yet in purchasing, these same persons would, probably, give general perfection first consideration.

When there is a better general understanding of what should be required in a premium fruit exhibit, there will be less dissatisfaction with the awards.

This better knowledge would often lead exhibitors to secure prizes, where they have otherwise failed, because of not understanding how to classify exhibits, according to the terms of the premium offers. A case in point is remembered where an experienced exhibitor in a certain section of the country, had made a display for five best winter varieties adapted to that section. Having some very fine Pewaukees, they were included in the set, and the premium was lost. His own second judgment would have chosen in place of Pewaukee, another variety which he had.

It is not probable that judges very often willfully make awards contrary to their own sense of equity, but exhibitors are jealous of their rights, and should be given every safeguard, which might reasonably convince them, that the fruit has been fairly judged.

If it were possible to arrange so that judges could not know the ownership of fruit which they are examining, it would remove the cause for much unnecessary dissatisfaction. One help to this end would be to have the entry tags turned over, and slipped under the fruit before judging. First and second prize could be marked on the backs of the tags before booking the award. This arrangement would help to identify the place for premium markings, if any might be overlooked, as is sometimes the case.

DISCUSSION.

Wr. President: I hope you will not let this paper pass without discussion. I have had some little experience in this line of work and I would like to get your experience. In my work at Chicago and at various county fairs I have worked on this theory: If we take into consideration productiveness, flavor and quality we have it as good as we can get it. I take 4 for size, 5 for color and 6 for perfection, that is, in regard to insects and fungus markings. The highest that could be got on the 6 points would be 60. Some scale for 100, but I find ten is better, and I have not gone beyond 6 points. Here is one award on six varieties of apples, 46, 47, 46, 57, 58 and 47, that is pretty close figuring. In that way you can get at the awards as fairly as they can be got at. Here is Mr. Coe, he has worked on lots of awards, we would like to hear from him.

Mr. Menn: Do you take keeping qualities into consideration?

The President: I do not usually unless it is some winter variety. I do not consider keeping quality necessary to that award.

Mr. Hager: Don't you think perfection should have a higher score than 10 out of a possible 60?

The President: It will hardly come up to that if you take the comparative value.

Mr. W. A. Toole, Jr.: In judging varieties under the last named point adaptability would not come under consideration except in collections.

The President: I would put adaptability, as I understand it, if I could get it in with the premium so it would apply to the adaptability of the trees and the varieties.

Mr. Toole: The Fall Orange, would you offer that as a variety?

The President: That would be for a special apple, this is in a collection. You could not get this in on single plates.

Mr. Utter: What would a foreign judge know about adaptability?

The President: Well, we don't appoint foreign judges.

Mr. Coe: One thing I should take into account, and that is uniformity. I don't think the largest apple should get the first premium. I think the whole plate should be uniform. If we buy a barrel of apples we want them of one size, color and shape.

The President: I would score them in size and imaginary perfection. I would have an ideal of the apple in mind that I would consider perfect. I would score it from 5 to 10; if it was big enough I would score it from 1 to 10 for size. If it was in color I would score it 10 for color.

Mr. W. A. Toole: The question of perfection or imperfection would be considered in my mind; it would be considered instead of size. I think I would look for codling moth and scab, no matter what their size might be. As indicated in the paper, I think the tendency is to lay too much stress on normal size and not so much on uniform size. We ought to have uniform size on the same plates.

Judge J. A. Gaynor: At the cranberry station at Grand Rapids I laid out for myself the task of gathering all the wild cranberries I could find growing, and after I got a good many varieties at our experiment station the task began to develop upon us as to their merits, and I found it was necessary to go at it systematically, to make some kind of a classification, some basis upon which to judge of their desirability. I made that myself and put it on the experiment station books, and the first classification I made was as to size. I took that first because I found that people—and I might state at the outset that I am not in the cranberry business for the money there is in it, although I do carry it on from the sentimental and scientific side of it—but I found that with people generally, nothing went so well as big fruit. When they saw big apples it opened their eyes, they were attracted by the large size of the fruit. Nothing seemed to take their fancy like size. The next thing to strike the people, to my mind, is color. A handsome color, especially if it was glossy, whether it was a strawberry, a glossy apple or a cranberry, they were attracted by the color, and so the next thing I considered was color. The next thing I found to take the eye of the people was shape. If it was a handsome shape, somehow or other, they would get stuck on the shape of the fruit, and so I put that third. For the same reason as the other I noticed that uniformity in fruit took the eye of the people, just as they would take notice of a lot of men wearing uniforms, they would look at them with a great deal of interest and admiration, whereas if they were all dressed different and were of different size they would attract no attention, but when they wore a uniform and were uniform in size they would attract attention anywhere. This is just as true of fruit as it is of a group of men. So I gave uniformity the fourth place. Then I took the productiveness of the fruit, then the keeping quality, the earliness or lateness of the fruit, and last of all the flavor. Now, the question will probably be asked, why did I put flavor last in this list of classifications. Here is the point: These characteristics have not all equal value. They have not an equal commercial value. If we have good size, color and shape of fruit, and uniformity, perhaps, I felt that the matter of flavor is not so important as the size and color class. We felt, too, when we gathered together all these varieties, and there were from 115 to 120 different varieties of cranberries, from all parts of the country, that we wanted a cranberry that would come up to these classifications. We wanted only a few varieties, three or four only, out of the group. What are the best varieties? That is the question asked. Now we wanted to know what was best for us at Grand Rapids; what was the best cranberry for us. What could we make the most money out of? That is what we were after. In determining the best berry we could not put the same value, we could not pick a berry with the same average all the way through. We could not put the same value on all the qualities of a berry, and I thought we should have a market form, a uniform scale, and that would not give the correct answer, because some of those qualities are of a higher commercial value than others, and the question was how much to credit size, color and shape. How much for color and how much for uniformity? It looks to me as though that matter of classification, getting to the merit of the fruit, judging the various characteristics of the fruit, requires a little fuller analysis than we have given it here. One would want a fruit that would ripen early, another would want a fruit that he could keep till May and sell in May, and somebody else would not care much for a fruit that would not give him a big crop. Of course, each of these characteristics has its special value, but to make a good classification out of all these merits seems to me would require a fuller consideration than any that has been suggested here, and an agreed schedule should be established here in which size should go for so much, color so much or gloss so much, shape or uniformits so much, keeping quality so much, to note their keeping qualities and note what the keeping quality is along in the spring.

The President: I should think you would want productiveness one of the highest points.

Judge Gaynor: Perhaps that is just the question that ought to be settled with most varieties.

Mr. W. A. Toole: It is not the question of a scale of points that we are not likely to agree upon or the value of the points, but on the other hand, we all feel it would be desirable to have a score card established by some committee to look carefully into the matter and settle on something that would be very good, and then something might be submitted, perhaps, that might even be better. I believe it would be a good thing to bring this matter before the executive committee and have a committee appointed to consider the matter or to prepare a score card. We are under obligations to the gentleman who brought this matter up. The question was overlooked in my paper because I was considering the subject from the standpoint of the apple tree fruit. I think one thing ought to be settled upon anyway, some provision should be made for those people who bring fruit from a long distance, because they are under a greater disadvantage than the man who brings his fruit from a short distance only. The man who brings his fruit a distance of a hundred miles ought to have greater consideration.

Mr. Converse: The fact has often been mentioned that the fruit exhibited should be grown by the exhibitor. I know a nurseryman who claims the right to exhibit fruit from any tree he has ever sold. There is a gentleman in this room who exhibited fruit at the Dane county fair who had a competitor who did not have the apples he had, and he asked him to borrow a plate so he could get the first prize. (Laughter.)

The President: That is the view we should adopt largely. We ought to make that a point that the exhibitor ought to grow his own fruit. A good many practice the idea of getting the fruit from any tree they may have sold or getting it wherever they can. About the scoring, I have adopted this plan in judging county exhibits. There were six varities in this case and this plan makes it easier to follow it out. This card is as it came from the printer, but I think productiveness should have the highest point.

Mr. W. S. Hager: This paper applied particularly to county fairs. Ordinarily the exhibitors at county fairs are not professionals, but they are usually farmers growing a small amount of fruit. The point I would like to make in regard to this is that the fruit I have seen that they have sent in for exhibition lacks uniformity, it lacked freedom from blemishes, the apples were wormy, they were infected with scab, defects which, if they had understood what the apples would be scored on, they would have remedied by not sending such apples, but they seemed to labor under the impression that the largest apple was necessarily the best apple. It was nearly twenty years ago that a premium was offered at a fair for the best fall apple. There were three judges. One man entered a Wealthy and another man entered an Alexander. Two of the judges said "This is the best apple," and the other judge said, "Taste them," so they tasted them and they said the Wealthy was the best apple.

Mr. W. A. Toole: I would like to make a correction. I will say the subject was my own choice and I thought I would allow my thought to go the same way. The way the subject was announced it applied only to county fairs. The way the paper was read it applied to any fair and exclusively to county fairs. You will see lots of fruit at any fair, but at the same time you will wonder why a great deal of it was brought there.

Mr. Delbert Utter: I attended an exhibition at Ogden, Utah, in 1893, and Mr. Taylor, who was manager of the agricultural exhibit at the World's Fair, was the judge. There was a $500 prize for the best exhibit from any state. Mr. Taylor gave an address that evening, and before he commenced his address he gave his reasons for awarding the prize as he did. It was awarded to Idaho, and while Utah had just as good an exhibit in color, appearance and flavor, equal or if anything better than Idaho, yet he awarded the prize to Idaho because their fruit was free from the appearance of fungus disease and insects. In all the other exhibits there was not a single sample that did not show an imperfection, so I think that one suggestion that Mr. Hager makes is a very good thing. I don't see why adaptability or productiveness has anything to do with judging at a fair. Mr. Taylor did not know anything about the adaptability or the productiveness of the fruit he was judging, but he had to take it as he found it and he judged it accordingly.

Mr. Hinckley: I have listened to this discussion with a great deal of interest. I have seen some fruits exhibited under three or four different names, and it seems to me a matter of that kind ought to have the attention of the judges.

Mr. W. A. Toole: I think there was a very important point overlooked in the paper. At a fair a person might show California fruit, and things of that kind should be remedied.

Mrs. Treleven: I think it often comes through the agents we buy our trees of, I think there is much due to that.

Mr. Irving Smith: I would like to add my word to what Mrs. Treleven has said. I have an orchard of several hundred trees. When those trees were set out they were all numbered and I wrote the number of each tree in a book, and when they got to fruiting and we wanted to know what kind of a tree a certain apple came from we got out our book and looked up the number. That is the way we could tell. I have shown those apples at different fairs, and I don't know that I have shown any yet, except it was the Wealthy, except for what it was marked. Sometimes people laugh at me when I say, for instance, "This is supposed to be the Utter's Red."

Mr. A. D. Barnes: I have no defense to make. (Laughter.) We are all liable to make mistakes, the planter as well as the grower. What I have been doing at Marshfield as a director of the county fair, we are employing someone to stay there and when those entries are made they are passed to that person. Those people are not to blame, they make no record of their plantings and they bring them in under the name by which they bought them. They don't know any better, and it ought to be our business, and we ought to make it our business, to educate those people right. We employ someone who is familiar with the names of the different varieties, and when they make an exhibit this party will see that they are entered under their proper names, and I think that is an absolutely practical and proper thing to do.

MARKETING FRUITS.

J. A. Gaynor.

The Methodist Church, as a religious organization, has been very successful, and to my mind a large part of that success is due to its peculiar custom of requiring each convert to "Stand up in meetin' " and tell his experience; and I have noticed that the greater the sinner the more they seemed to profit by his account of his past sinful life. Now, if you will substitute the word ignorance for the word sin, and remember that when I say fruit I mean cranberries, it is possible you may profit by the story of my experience in marketing fruit.

About twenty years ago, I became interested with my brother in a cranberry bog. He could handle the shovel and sod hook and manage the work with good results, and he insisted I should do something to entitle me to a share in the profits, so when our first little crop was gathered, I had to do the marketing,—a business for which I had no taste or aptitude.

At first we were able to sell our fifty or seventy-five barrels to the retail grocers and fruit dealers direct, a barrel or two at a place, on thirty, sixty or ninety days time; but not withstanding my experience as a collector, I often spent more time in collecting these accounts than I did in selling the fruit.

When the business developed and the crop became larger we were forced to consign to commission men. It is probably unnecessary for me to tell you that we soon got awfully tired of that set of rascals " for you know how it is yourself."

Later we sold through brokers and wholesale grocers. At the outset, we thought the broker would act as *our* agent, and look out for *our* interests; but we soon discovered it paid him better to stand in with his customer at the other end of the line and support every objection to the fruit that his patron could invent to secure a rebate on the agreed price, or to enable him to undersell a competitor.

The wholesale grocer would seldom buy in carload lots. He preferred to take orders for our berries through his traveling salesmen who sent us the orders; we shipped direct, a barrel or two to a place, as the orders came in. This was not a bad way of selling, but it required a man and team on the road to deliver at the depot during the marketing season, and without a shipping clerk or book keeper, the accounts became badly tangled up before the end of the season, and the results were sometimes very annoying, besides we were liable to come in sharp competition with a neighboring grower who adopted the same method of selling his crop when the two wholesale houses covered nearly the same territory. Later still we sold our crop to jobbers, a car or two at a time, and for three or four years past we have been selling to shippers who purchased the entire crop and paid for it when loaded on the cars. These shippers sold to or through jobbers, brokers, commission men and wholesale grocers. This proved quite satisfactory to most of our growers. A year ago last fall the four principal Western cranberry shippers combined and bought up nearly the entire Wisconsin crop. The result was so satisfactory to us we asked them to combine again the past season. They did so and sent their representative, A. U. Chaney of Des Moines, Iowa, to do the purchasing. His coming had been announced, and at the same time we called together all the cranberry growers on the Wisconsin Valley to meet to discuss the state of the market and the price we could command. When we agreed upon a price, that in our judgment the market would sustain, we then called in Mr. Chaney and gave him our views, and in less than an hour the contracts for the sale of our entire crops (about 10,000 barrels) were closed. Although I took a large part in bringing about the combination of the growers and shippers, it was less work and worry to me than I have often expended on the sale of a single car, and this result this year has been so generally satisfactory that the Wisconsin growers are organizing a Sales Company through which they hope to do their marketing in the furture.

You might get the impression from what I have said that I thought the cranberry grower a very innocent, upright fellow, and the rascal who made all the trouble was the other fellow, but I am sorry to confess that many of our growers in the past have been both ignorant and dishonest and their ignorance and dishonesty will account for a large part of their grievances.

They frequently did not know how to grade and pack their fruit. They often sent it to market in a most unattractive condition. Some growers used barrels that lacked several quarts of being of the standard capacity, but so shaped and manufactured as to produce the impression they were of full size. But in this respect they were not as bad as the strawberry box we usually see on the market,—the bottom was not in the middle of the barrel. The berries were often poorly packed and shook in the barrel before they reached their destination. Formerly it was not uncommon for growers to practice what is known as "Facing" or "Layering,"—the best berries at the top and bottom and rubbish in the middle.

The season for marketing cranberries extends from September the 1st, to May the 1st, but fully one-half of the crop is consumed during the last six weeks of the year. Size, shape, color and soundness are the principal characteristics considered in making a sale. Some markets will take only large berries, while in others the small berries sell readily. Some demand dark colored berries, while others prefer the light. In some markets the long bugle shaped berries, even when small, will command $1.00 a barrel more than round berries; while in other markets little attention is paid to the shape of the fruit. Some markets take cranberries during eight months of the year, while in others the marketing season is only a few weeks. Some markets are overstocked, while others are without berries, and a large part of this knowledge is unknown to the busy grower who has to spend a good part of the year with his hook and sod knife, and, if he should happen to consign his berries to their best market, it will be purely an accident that is not likely to happen.

Cranberries are usually shipped in cold weather in refrigerator cars, and are liable to freeze if exposed long to a temperature of ten degrees below the freezing point, and if the weather is cold or the distance great, the car has to be specially prepared for the journey, and even then, if windy zero weather overtakes it on the way, it must be run into the nearest roundhouse for shelter until the cold wave is past, and it is only an experienced shipper that can arrange for this and many other things required in successful shipping, such as diverting a car from its original routing, sending a tracer to prevent delays, fixing liability upon the railroads or purchaser when their neglect is the cause of loss.

Every grower is anxious to promote the sale and consumption of cranberries and secure better prices for his fruit, so I feel that I should state some of the things the growers can do to promote consumption and secure better prices.

Price is the ratio between supply and demand, and varies inversely as the supply, and directly as the demand. It is a curious fact that the grower has very little control of the supply. When the last box is picked, the supply is a fixed quantity. It is out of the power of any man to increase it that season, and no grower can afford to destroy the whole, or any part of his crop, for the purpose of lessening the supply and increasing prices; neither would it pay if all the growers combined to destroy a part of the whole crop for that purpose; for it can be shown from statistical tables giving the total cranberry supply and prices extending back over twenty-four years, that if ¾ of the crop of any season were destroyed it would not double the price at which the remaining ¼ could be marketed; that one million bushels will be taken by the consumers at $2.00 per bushel and that one-fourth of a million could not be marketed at $4.00 per bushel.

To investigate further the influence of price on consumption, I submitted the following question to 20 different retail fruit dealers:

"If during the time it took you to sell 100 quarts of cranberries at 8 cents a quart, the price of the same berries had been 10 cents, how many quarts would you have sold? If 12½ cents how many? If 15 cents how many? I wish to get your best judgment as to the effect of price on consumption of this fruit as you find it in your business." The average of the answers were as follows:

"At 8 cents 100 quarts, at 10 cents 91 quarts, at 12½ cents 45 quarts, at 15 cents 23 quarts."

This result agrees very closely with the reports of total crop and prices over the period of 24 years above referred to, and so sensitive is consumption to price that when the supply and quality are known at the end of the picking season, the price at which it can be sold may be predicted with a high degree of certainty.

If the opening price is put too high and kept too high, a part of the crop will go into the dump at the end of the season, and if the price is put too low and kept too low, the whole of the crop may be consumed before the marketing season is half over.

A just price and a price that will promote consumption, should be an advancing one. If berries are sold in September for $5.00, October for $5.75, in November for $6.25, in December for $6.50, in January, $6.75, in February, $7.00, in March, $7.25, and in April for $8.00, this rise in prices will be nearly a just compensation for the shrinkage, risk and interest on the investment; for if the whole crop were kept until the first of April, the whole shrinkage, under the usual present conditions for keeping, would not be far from 33⅓%, and although there are some varieties that are good keepers they should be kept for the late market and should command a higher price for that reason, and the varieties that will not keep should be sold early at lower prices. A steady advancing price that is low enough to secure the distribution of the whole crop by the close of the marketing season, will yield to the growers the largest money value for that crop; and any deviation from such price works an injustice to consumers and a loss to the growers.

Now, from what I have stated as to the relation between distribution and price, the truth of the following paradoxical proposition will appear:

If all the cranberries of the United States, at the close of the picking season, were assigned to one man as trustee for the consumers, who was able to distribute them, and his aim was to make a just distribution to all the consumers through the whole marketing season and to serve these consumers justly, fully and fairly, caring nothing for the growers, his prices and distribution would be precisely the same as if he had been trustee for the growers and his aim was to get the most money he could out of the crop. Hence it follows a cranberry trust cannot exist as it is practically out of the power of the grower to diminish the supply; he can only increase the price of his fruit by increasing the demand.

Now, the quantity of cranberries, or any other fruit, that will go into actual consumption in any season depends not only on the price, but also very much on the condition of the fruit when it is put into the hands of the retail dealers. The desire for, and the consumption of the fruit, is very much influenced by its appearance. I know of nothing that appeals to the appetite and causes a desire to purchase so much as handsome fruit; and I know of nothing that will destroy the appetite quicker than decaying fruit, unless it be a rotten egg. The existence of unsound fruit on the market lessens the demand for and consumption of sound fruit.

The price and attractive appearance of the fruit remaining the same, the amount that can be sold will depend also on the extent to which it is exploited, displayed and offered in the market. Many more cranberries will be sold in this city if they are well exhibited to view in every retail grocery and retail fruit store than would be sold if only kept and displayed at a single store. On a firm or rising market, every retailer will find it profitable to have this fruit for sale and display. On a falling market, he finds it a dangerous commodity to handle and will not give a second order until the last barrel of the first order is sold; and if he finds that he has lost on account of the decline in prices he may cease to handle it altogether during the rest of the season, and should he have a customer who would think of ordering the fruit without seeing it on exhibition, he might fill the order from his neighbor's supply.

So next to price and quality of the fruit a declining market has a depressing effect on consumption, while a rising market stimulates consumption.

The influence of all other fruits on the consumption of cranberries is so nearly constant, it may be omitted in making up the market equation for the sale of the crop. But the three independent variables—*Supply, Quality* and *Distribution*—must always enter into the equation that determines the price at which the crop should be sold.

Enough has been said to satisfy any grower that the marketing of fruit requires a special experience, skill and knowledge that is seldom possessed by the grower, and he can acquire such experience, skill and knowledge only at the loss of time and money that could be more profitably applied to his own special calling. Nearly all the losses the grower has to sustain results from either ignorance or dishonesty.

The remedy for reducing these losses on sales to a minimum is simple. Let the growers of a locality organize a sales company to act as their agent. This company can hire one skillful, experienced, reliable man to inspect the cleaning, grading and packing. Then they should employ an experienced, reliable shipper to look after the selling and distribution, and these two men should be supported, rather than dominated, by a board elected by the growers.

The success of this company will depend on the skill and integrity of these two men and the support they receive from the board of directors, and if the company is not able to select men who are not more successful in these respects than the average fruit grower has been in the past, the company should disband and the growers go out of business.

We have drawn up the Articles of Incorporation and are now organizing such a company for the marketing of our cranberries, and with slight modifications our plan can be made applicable to the marketing of other fruit. If a large number of such companies were organized in the state for the sale of fruits and other products, I can see many ways in which we could cooperate and help each other. We could soon put dishonest commission men and brokers out of business.

I have with me a copy of our Articles of Incorporation and Application for Membership. If any of you contemplate the formation of such a company in your locality, it will pay you to examine them.

Here in the presence of University students and professors, I might be permitted to summarize much of what I have said in an Algebraic formula, thus:

Let P = Price
Let S = Supply
Let D = Distribution
Let Q = Quality of fruit

Then the market equation for a whole crop would stand thus:

$$P = \frac{D\,Q}{S}$$

Now, the distribution should be considered under two factors, 1st—The number of places at which the fruit is offered for sale. 2nd—The length of time it is exhibited and kept for sale at those places. If I represent the 1st by "N" and the 2nd by "T" my equation becomes

$$P = \frac{N\,T\,Q}{S}$$

Further, the quality of the fruit may be considered under its variable factors, viz.: soundness, color, uniformity and package. If "s" stands for soundness, "c" for color, "u" for uniformity and "p" for package and these are substituted for the letter "Q" in the last equation, our market equation stands thus:

$$P = \frac{N\,T\,s\,c\,u\,p}{S}$$

The second member of this equation represents all the independent variables whose value must be ascertained or estimated before the value of "P" can be known; and with the exception of "S" all are more or less under the control of the growers, and any increase in their values tends to increase the value of "P" or the price at which the given supply can be marketed.

It is in the power of the grower to secure a more extensive and intensive exploitation and distribution of his fruit. It is in his power to deliver to the retailer sound handsome fruit of uniform size, shape and color in neat packages; and if this is well done four times as much fruit in my opinion would be taken by the consumers without reducing the price.

This can be done only by organizing the growers and enforcing better packing and a more thorough intelligent system of distribution.

THE CONTROL OF MARKETING.

H. B. Hotchkiss.

Several weeks ago I entered into a correspondence with the Secretary of this Society on a subject a little different from the title of this paper. For a number of years I have been interested in a small way in the berry-growing business, and a very serious part of it to me has become the disposal of the crops at profitable prices.

When I first began raising small fruits, especially the strawberry, there were but a few of us around Eau Claire in the business and we found ready sales at remunerative prices in our own city. But from perhaps eight or ten ununited growers, we have increased in numbers until we now have 125 members in the local Fruit Growers Association beside quite a number of growers who are not members. As a consequence, our home city can no longer consume the fruit.

In the early nineties I commenced shipping my fruit to Duluth, and when raspberries were only bringing seven or eight cents per quart on the home market I received twenty cents per quart at Duluth. As time passed others commenced shipping. The commission men received more fruit and the prices began to drop. It would be several weeks after date of shipment before we would receive our returns. It was rather perplexing and disheartening this waiting the pleasure of the commission man in making returns, for we could never know whether our berries were bringing a fair price until too late to help matters. This unsatisfactory condition of affairs resulted in the birth of our association for mutual education along the lines of production, care, selling, etc.

The first year of concerted action, we invited the commission merchants of St. Paul, Minneapolis, Duluth, Superior, and Ashland to send representatives to one of our meetings, stated our grievances to them and asked them to make us some proposition to induce us to ship to their respective houses. We had several houses from St. Paul, Minneapolis and Duluth represented. They made us propositions, and we adopted what seemed to us the best houses. The first season everything went along smoothly. My strawberry crop brought me on an average for the season $1.20 per 16 qt. case. The second season commenced to tell the commission tale. Quotations would come in just before we began shipping, "Southern berries all cleaned up to-day at $2.50, market bare, ship car of berries as soon as you can." We make them a shipment and receive in return a nice letter stating that they received a car of berries from Missouri, or some other point, that were poor which caused a decline in prices, and we get perhaps $1.50 or $1.75 on a $2.50 quotation. A card also arrived stating "Everything sold out, ship all you can to-morrow." We ship all we can, and get a card stating that it rained and trade was dull, so prices remained low or even dropped lower. Of course we all know that berries in a refrigerator car with six thousand pounds of ice in the chest are quite likely to spoil just as soon as they are re-billed, without even being opened, to Winnipeg or some other point, especially if it rains.

Thus it goes day after day. We get quotations of good prices, but still the returns are from 25c to 75c below market quotations. This last season people from the cities where we shipped our strawberries told us that $1.20 was the lowest price berries were sold for by the crate, and yet 42c per crate returns were issued to the shippers.

We have become dissatisfied with our unfair returns and are casting about for a remedy. The first answer to the problem to present itself was an association canning plant to can a large enough portion of the crop to cause a scarcity of fresh fruit; but we are only a small part of the growers who reach the market, and consequently our unaided efforts would be in vain. The next solution of the problem is the one suggested by the author of this paper, and over which your Secretary and the author have had some correspondence. It is to hustle around, see that a bill is brought before the legislature and passed appointing officers over the commission-house accounts similar to the bank examiners.

Why do we have a bank examiner? Is it not to prevent the bank officials making false entries on their books and defrauding the depositors out of their hard earned money? If this is true why is not the shipper also entitled to protection from fraudulent entries on the books of the commission house? I verily believe the consignor has less protection in his accounts than the depositor. The consignor merely has his freight receipts showing the number of packages shipped and their weight, while he who makes a deposit in a bank has his certificate of deposit showing how much the bank owes him to a cent.

The consignor may ship $1,000 worth of produce and there is nothing to prevent the consignee making a $500 return, even though he be solvent, while the depositor puts his $1,000 in the care of the banker, and at any time draws out the full amount as long as the bank be solvent.

There is yet another and I believe a better way by which we can obtain profitable prices for our fruits, and that is *organized* and *systematized* control of marketing.

Let us consider this question thoroughly. Could not we, of this part of the country whose fruit is ready for market at the same time, form an association, say a district, state or even an inter-state association and through the knowledge of the expected yield, obtain through the local societies, set a profitable price on the fruits and each shipping point hold for the same price to the commission house?

If the commission men once find that the growers of fruit are united and that when Sparta fruit can be obtained only at a certain price, they turn to Eau Claire and other producing points and meet with the same quotations, will they not use all the berries or fruit they can handle just the same?

The trouble at the present time is that we all dump our fruits on the market without any system. Sparta and Eau Claire are the two largest shipping points in the northwestern part of the state. Both have good shipping facilities to St. Paul, Minneapolis and Duluth. Sparta ships, say, five cars of berries to a certain house in Minneapolis, Eau Claire knowing nothing of the shipment, puts three cars more to the same house on the same date, and a slump in prices follows. Both shipping points are disatisfied and make the next shipment to another point, hit the same market again and do not know it until it is too late.

If we had a district shipping association or fruit exchange, the manager or superintendent could telegraph each local association the best market to ship to and thus avoid overloading any one market and ruining prices.

I am quite certain that it would be a profitable investment, even for our local association to maintain a marketing superintendent who should devote his time during the shipping season to watching carefully the markets of St. Paul, Minneapolis, and Duluth, and directing from those points our daily shipments. If, as one of my neighbors stated to me, it would be a profitable investment for him to place a man at Duluth at his own expense, would it not be more profitable for us to act together as one person and put a capable man in a similar office representing the district? Such a man could be hired for $100 per month, and his necessary expenses would not be over $200 per month. As our strawberry shipping season is not over five weeks, the total cost would not exceed $375. This would be but $3 apiece for the members of our local association, and a capable man would easily be worth several times this amount in the saving effected.

It is much easier to hold the price up than to raise it after it has gone down. The tendency is for prices to gradually lower until the crop is about all harvested, and then come up a little. It should be possible to get a profitable price for our fruit the whole season through.

It seems, as one beholds the beautiful and luscious fruits, the results of his study, experiments and labors, that such returns are ample reward. In the days of Adam and Eve such might have been, but in this twentieth century it will not suffice for the occasions that arise. We must not be satisfied with the present results for they are too inadequate and unjust.

When one considers the cost of production as a Morgan, a Rockefeller, or an Armour would figure it were he in the business, what would be the satisfaction of 50c or even less on a sixteen-quart crate of strawberries? On the other hand what would the producer receive if he watered his invetments as thoroughly as the above financiers do theirs, and then demand a profit besides as they do? Would the price the Lang Canning Co., of my home city, offer of 64c per sixteen-quart case of strawberries be acceptable? Mr. John Herbst of Sparta who lectured on the strawberry at the Farmers' Institute held in Eau Claire last winter stated to me in person that the cost of producing and placing on the market a sixteen-quart case of strawberries was 65c. Just one cent more than the Canning Co.'s offer.

Can I do business at even 1 cent loss per case and depend on my berry income to pay running expenses, pay for my farm, feed, clothe and educate my family? Any business man says no. If I can not do so at a loss of one cent per case, how much less can I do it when the loss is twenty-three cents per case as I find occurred in the latter part of the 1904 shipping season?

Such being our condition, I firmly believe that to become thoroughly organized and work as a unit is the only real remedy for our financial difficulties as producers. I wish to tell of an occurrence that one of my neighbors met with which upholds this belief in organization.

He, with a number of other farmers, met with the agent of the International Harvester Trust to settle the last note for some piece of machinery. My friend, Mr. Welch, said to the agent, "Mr. Smith, do you believe this harvester combine is going to benefit the manufacturers?" "Oh, Yes!" said Mr. Smith; and went on to explain the benefits of the combine. When he had finished Mr. Welch asked him if it would not be a good scheme for the farmers to combine on selling their produce and stated that some of his neighbors were tumbling over one another to join a farmers' society of some kind with headquarters in Indiana. "Oh!" said Mr. Smith, "that must be a branch of the Everritt movement. It is spreading like wild fire, and in one state they have already passed laws forbidding the International Harvester Combine the right to unload any of their machinery in the confines of the state. Whatever we ship into that state passes clear across and out the other side.

To use Mr. Smith's term, "This Everritt movement is a great thing for the farmers, but it will not last, as the farmer is too jealous of his neighbors' success, and the movement will fail through discord, but if the man at the head of the International Harvester Co. were at the head of this farmers' movement it would become a "World Shaker."

If organized co-operation is as highly remunerative to these great combines and gives them such unlimited power as Miss Tarbell's article on "Standard Oil," Mr. Lawson's "Frenzied Finance" or Mr. Russell's "The Greatest Trust in the World, the Beef Trust," prove, is it not a good example for us producers to follow, if we desire financial success? If these gigantic concerns are so successful in merchandising in the fruits of the producers toil, ought not the producers who furnish the material on which every known business depends for its existence, to be the most successful if they follow out the business principles of these powerful concerns? If so, all I have to say in conclusion is, let us organize into a producers' combine; but let us look to the rights of the consumer better than the beef trust and not be exhorbitant in the profits which we ask above the cost of production. Let us be business men and run our farms with an itemized account of the cost of production, and then sell only at a profit.

We can organize gradually; first, as local associations for the purpose of supervising the commission houses, and getting the best possible returns from our produce under the present system; then as we get stronger in numbers and more united, and as we gain confidence in ourselves, it will be easy to organize a co-operative commission house to do our own selling as we are already doing a large share of our own buying. Then we can take in other associations and make our enterprise beneficial to a gradually widening area. This plan is being followed in other parts of the country and we should fall into line.

DISCUSSION.

The President: These two papers being on the same subject have followed each other without discussion. They are now open for discussion. This is an important subject and I trust you will make good use of the time.

Mr. W. A. Toole: I am glad we have had these two papers. I can see the great perplexities that confront the fruit grower. If we are successful in fruit growing, whether it be strawberries, apples, plums or cranberries, it is not worth a great deal to know how to raise them if we cannot market them profitably. We find in our apple growing this question involved, the lack of proper distribution, the crowding of the markets with our apples at a time when everybody is shipping in their apples. We might do a great deal, we are spreading out in our Society, but I do not know that we are adding to our success along this line of work, and I do not know but what if we might have reports from various markets it would be a good thing. If we had a general supervision over local interests there is a great deal that might be accomplished. We are going to look into many things at this meeting. This question of organization is a large one and an important one. As I said before, if we raise fruit in marketable quantities and are capable of raising good fruit, the important feature, after all, is to find a profitable market for it.

Mr. Utter: I would like to say just a word on this subject, and I think it is proper to form these local associations, not only to endeavor to obtain better prices, but to see that goods are in better shape where thy have to be shipped to commission men, so that they will bring better prices. I think they rubbed the commission men pretty hard. I deal with commission men nearly all the time because I am in a position to do so. There must be co-operation between you and your commission men and not antagonism, because I believe the commission man wants to get just as good a price as he can possibly get. When we see fruit upon the streets going to pieces we know he has his troubles as well as we have ours, and he is working at his end as hard as we are working at ours. That is something that cannot be comprehended. Here are certain days on which two-thirds of the grocers will not buy anything, and that makes a considerable difference in the amount of commission as far as the sale on that day is concerned. These are conditions that shippers have to contend with. I believe in these associations as much can be done to see that fruit can be shipped in the best shape and is of more importance than to try to control the price.

Mr. Irving Smith: I am glad to hear this from Mr. Utter in support of the commission men. There seems to be a general opinion among a great many people that there is no honesty in a commission man and that of necessity he is almost a scoundrel. There are just as many scoundrels among growers as there are among commission men. (Applause.) I do not know but what I might say there is just as large a proportion of thieves and scoundrels among growers as there is among commission men. I have shipped goods to commission men as far back as I can remember, and we have had them steal whole barrels and we have had them make honest reports. There are honst ones and dishonest ones, and I do not want to take the commission men in a wholesale lot and say they are all thieves no more than we want to be called thieves as a body of fruit growers. (Applause.)

Mr. Nicolai: I would like to add a little of my experience to show that as a rule commission men are honest, and to endorse what the last gentleman said. Up to within three years I used to market most of my strawberries myself to the retail grocers in Milwaukee. I branched out a little more and I could not sell them all to grocers, so I turned them over to commission men, and my experience has been that they are perfectly honest, and I have realized more from strawberries the last three years than I ever did before. One reason is that I have become more honest. I was one of the careless growers. The last two years I have been attending to the crop more in detail, and I have made it a point not to have any small and poor berries put in, and the bottom of the boxes in the crates are just as good as those at the top, and the consequence has been that my berries are sold before they are picked, they are engaged before they are marketed, and some of the best dealers in Milwaukee have their teams there and are waiting for my berries. This was encouraging to me, and I have obtained a good price this last year on my whole crop, they netted me a trifle over $1.25 a crate for a 16-quart crate. A year ago they netted me a little over $1.28 a crate, and I find there are just as many honest commission men as there are honest growers. I believe the majority of them are honest, but there is a great deal to be learned in putting up berries, in putting up a good article, something that is just as good at the bottom as it is at the top. If you have fulfilled all those conditions, then put your name on the crates, and if you use pasteboard boxes you can have your name stamped on each box, and let it be known to the consumer who is grownig the fruit. The consumer will call for those berries from his grocer every time. I know my goods are called for when they go to the grocer.

The President: I had a little experience that was, perhaps, somewhat unique. I had a couple of thousand bushels of Duchess apples, the finest in the land, they were very fancy. I took a couple of barrels to St. Paul and from there I went with them to Minneapolis. I went to a commission house I had done business with before, and they wanted to know what I wanted for those apples. I said I wanted two dollars a barrel. They did not know, they could hardly see their way clear to paying that price for them, and still they did not want me to go away, they did not want me to go to Minneapolis. The commission man at St. Paul did not want to make a bargain for them, but he said he knew he could pay as much for them as anybody else. I said to him that I had made a partial bargani at St. Paul for a carload of those apples at $2 a barrel, and I told him I had agreed to go back there and so I wanted to sell him a carload then. I went back to St. Paul and made a bargain and they said they would take a carload, and I went home that night to get them ready. I asked them if there should be any rain if that would make any difference. No, no, they said it would make no difference at all. I picked a carload, and in the meantime there had been one day's rain when we could not pick. I wired them that the apples were ready to go, and the reply came back that it was too late, they did not want them. I had made a distinct bargain with them at two dollars a barrel, and one day spoiled the trade.

Mr. W. A. Toole: I think we would be unfortunate if this discussion should be carried on merely on the question of the honesty of the commission dealer and the grower. There is a great deal of education we want to promote between the grower and the commission man. I think an organization of this kind might accomplish a great deal of good in promoting a better understanding between the commission man and the grower.

Mr. Hale (Mich.): I think a year ago you had under discussion to some extent this same topic, this marketing question, and I see you are more interested in it now than you were then. If the grower is strictly honest and puts up his fruit in a strictly honest way he will not have much trouble with the commission man. On the other hand, we have dishonest commission men, but we have a whole lot of dishonest growers. The most dishonest people you can meet are the growers. I want to modify that statement in this way: A man is perfectly honest, and he thinks he is perfectly honest, yet he will put inferior fruit in the center of the package where it will not be noticed. He will do it every time; it is human nature, but it is done, and some are worse than others.

Mr. W. A. Toole: How is it in regard to peach growers? Are the peaches packed by the growers?

Mr. Hale: I was invited three weeks ago to talk on this marekting question that was engaging the attention of the Central Packing House System. As stated last winter, I have been manager for a number of years of the Central Packing House

System. All the fruit is brought direct from the orchard to this one place and is packed in a uniform grade under one genral supervision and a guarantee goes with it that everything is as represented. I went there and met some three or four hundred growers, and the first thing I said to them was, "Gentlemen, you are here to listen to what I have to say, and I want to tell you about the worst trouble that the farmer and the grower has. It is already stated that these men have an organization for the handling of this business, and if we hang together we can make this one of the very best paying business propositions." It is a good thing to get together. People do not see what their neighbors grow, and they have an idea they grow just as good fruit as their neighbors. A grower thinks he is honest, but such is not the case. Such a proposition could be worked out by fruit growers everywhere, in Michigan, Wisconsin, Illinois, Iowa, Minnesota, or anywhere else.

Judge Gaynor: I am glad to see that the purpose of my paper was not all wasted. It is all nonsense to talk about the honesty of the grower or the commission man. They all average up about the same. Human nature is the same the world over, and I think I stated clearly that growers were no more honest than the rest, and I suggested organization to overcome two great obstacles. There is nothing new in my statement. The whole world is suffering with dishonesty today as much as it ever did. You cannot overcome this by organization. There is organization in society just as there is organization in national affairs, and if we push organization any faster than the intelligence of the people will admit we will make a mistake. We study out a new plan; it looks well, if the people were only intelligent enough to look at it the same way we do. That is one of the mistakes I used to make when I was an enthusiastic young man. I set out to study up a fine plan and I was going to impress it upon everybody. There is nothing that stands out more glaringly as a sample of dishonesty than the average strawberry box, the bottom of which stands within a few inches of the top.

Mr. Utter: Do you grow strawberries?

Judge Gaynor: No, I do not.

Mr. H. B. Hotchkiss: He is not a strawberry grower or he would have known that the space at the bottom of the box is put there for a purpose. That space at the bottom is left so that the boxes can be heaped and other boxes set on top without crushing the fruit in the boxes underneath.

The President: I suppose he referred to the space at the top of the box. (Laughter.)

Mr. Hotchkiss: A man in Eau Claire bought a box of my berries and asked me, "Do you claim this is a quart?" I said, "No, I don't claim it is a quart, it is a box." His wife brought in a quart measure and measured the contents of the box, and she said, "If anybody asks you that question again tell them there is a full quart and more." If berries are packed properly and carried to market they naturally will settle to some extent. You may heap a box as high as you will and put the other box over it without injuring the berries in the lower box, and the berries in that box will settle a great deal more than you will imagine. As far as commission men are concerned, I don't think there are many men in the fruit business that have been bitten as we have been in our section of the country. You would not think so by hearing some of these men talk.

Mr. Utter: How many years have you shipped berries to commission men?

Mr. Hotchkiss: I have been in the berry business for seven or eight years.

Mr. Utter: It takes a long time to find the honest ones.

Mr. Hotchkiss: It is a fact when we do find an honest commission man we tie on to him.

Mr. H. G. Street (Ill.): It seems to me it is hardly fair to try to be too honest in this matter. The average consumer cannot tell the difference between the full quart and the wine quart measure. If a man thinks he is a little more honest than his neighbor and gives a dry quart measure he gives a good many more strawberries than his neighbor, while his neighbor sells the regular box measure that is recognized everywhere. That would not be honesty or fairness on the part of the man who uses the larger measure.

Mr. H. B. Hotchkiss: That box I spoke of a moment ago was one of those wine quart boxes, and it holds several cubic inches less than the standard quart, yet at the same time that wine quart measure when properly filled holds a full quart and more than a quart as was shown by actual measurement.

Mr. Hale: We do not deal with commission men, but we deal directly with consumers and we find we have got to be honest. When we are picking berries and find a few extra large berries I instruct the pickers to put them in the bottom of the box, and the customer is a great deal more delighted to find big ones at the bottom than he is to find them on top. We use the dry measure quart and round up the box, and as we have to haul them around and do necessarily settle to some extent we often empty other boxes over them and fill them up from extra boxes we carry around with us for that purpose, and often they get a handful or two more than a quart measure will hold.

Mr. Geo. J. Kellogg: You cannot get ahead of our grocers. They will take the boxes out of a crate of berries and loosen them up, pour them out and put the little berries in the bottom and the big ones on top, and when they get through they have two or three extra boxes from each crate. (Laughter.)

Mr. S. L. Richardson: The situation we are facing in our section of the country is a practical question in many ways. We have, I suppose, three or four hundred acres of strawberries, and there is a strong tendency to increase the acreage, and the practical question before us is as Mr. Hale has suggested, can we take perishable fruit like strawberries, can we crate them up in any uniform method, can we bring them to our association packing shed, repack them in the crates, put our stamp upon them and send them along? It is an admitted fact that you can do that with the plum and peach and apple, but with the strawberry we are facing a different proposition. Then it is also a matter of weakness of human nature. I think in many cases we should be given credit for ignorance rather than for dishonesty. It is human nature for every man to believe that his berries are number one, that they are excellent or fancy or whatever we call our best grade. Here is a neighbor who is growing his berries in an old bed five years old, his rows five or six feet wide, but he believes he is growing a number one, extra fine fruit, and is it any wonder under such circumstances where we ship in carload lots that our berries do not grade uniform in size, color, texture and consistency? I think it is no wonder, so the best we can do at present under the circumstances is to conduct among ourselves a campaign of education, to try to grow better and bigger berries, to study the market, to study the shipping question and to work in the way of increasing the intelligence of our growers so that these facts, these obstacles that confront us now will not make our fruit undesirable to the commission man. Here are two farmers who are growing strawberries and sending them to the commission man at the other end of the line. They will both ship in the same consignment and receive pay for a similar number of crates. When the returns for the consignment are made, one of the men receives 42½ cents for his berries and his neighbor, who shipped in the same car, receives 68 cents. When there are such differences as that there is something wrong somewhere. There is a mistake somewhere and we are trying to find the mistake, and to gain that knowledge is why we have come down here, Mr. Hotchkiss and myself, looking for information. We want your help in solving the problem and we came down here to make a plea for your assistance, for your co-operation. These are the questions that are coming to us in our work and want you to assist us.

Mr. H. B. Hotchkiss: The rule of our association is that every man who ships berries must have his name and address stamped on one or both ends of the crate. I will not hesitate to say that my berries are first class berries. I shipped to Duluth and the report came back that my berries were poor. Some four or five months after the berry season was over I had it reported to me by some parties that came down from Duluth that my berries were the best on the market, and it surprised me. That is a sample of the dishonesty of the commission men we have to deal with. One of our members, a lady, had 17 crates of a large crab that she shipped to a commission house at Duluth. They remitted pay for four crates and reported that the others had spoiled. The facts are, and

I saw it myself, that she laid some of those apples out on the grass and they lay there for six weeks in all kinds of weather without spoiling. They reported back that those apples had spoiled in transit. She reported back the condition of the apples she had left out under the trees, and they replied that they must have been mistaken and apologized to her. They said they got her shipment mixed with one from Iowa.

Mr. Converse: There is one question I would like to decide here. My understanding has been that the scant quart is the same measure that is used when we go to a grocer and buy a quart of cranberries and peas. If we have a box manufacturer here I would like to have him state about that.

Mr. Portman: It is a legal standard quart. It is a quart that averages up to the Illinois quart or to the 24 box crate, which contains boxes, as we all know, 4½ inches square and 3½ inches deep on the inside. By heaping it over full it will hold a full quart.

Judge Gaynor: How many legal quarts have we in Wisconsin?

Mr. Portman: We have two that I know of, the scant quart and the shallow quart.

Mr. Utter: This scant quart is the liquid quart, not the regular grain measure quart. The grain measure quart is used to some extent, and the man who does use it does not get any credit for it. This scant quart is used by most growers.

Mr. W. A. Toole: A number of years ago when I was in the black raspberry business I became quite elated with the idea that I would give the people a good honest quart, and let the people know how much better measure they were getting from me than from other men, but the people did not seem to care a snap, and neighbor Brown got discouraged and we had to go back to the former measure.

Judge Gaynor: I wish to say a word in regard to this matter of the quart measure. I do not know of anything that is in as bad shape as the quart. I had occasion to look this matter up some years ago, and four years ago I drew a bill fixing the size of the cranberry barrel, and I wished to fix it at 100 quarts, and before I could compute the contents of the barrel, before I could fix the size of the barrel I had to know what a quart was in order to make the barrel hold 100 quarts. There is, perhaps, no one here who can tell the exact number of cubic inches in a wine quart. (Answer, 57 8/10.) That is right; now how many in a dry quart? (Answer, 67 2/10.) That is correct. There are 32 quarts in a bushel. Now take it at 67 2/10 and divide and you do not get the result. In water it means a quarter of a gallon. Now, which one of these four quarts should I use in making up the cranberry barrel? I did not take the scant quart and I did not take the dry quart. There is where there is a great deal of confusion and the law in relation to this matter ought to be amended. There is no need in this day and generation to have such confusion. I looked around among the grocers to see what they were using, and some were measuring with a tin quart and some with a wooden quart. Upon investigation I did not find one man among them that knew the difference betwen a tin quart and a wooden quart. I found among the grocers that they were absolutely ignorant of the difference between the two quarts. It takes about six liquid quarts to make five dry quarts. I think some years ago you agreed to sell strawberries by the liquid quart. The right measure is the liquid quart.

PROGRAM BY THE STUDENTS OF THE HORTICULTURAL DEPARTMENT OF THE UNIVERSITY OF WISCONSIN.

J. G. MILWARD, O. G. MALDE, B. E. FELDKAMP.

IMPROVEMENT OF ORCHARD FRUITS.

James G. Milward.

Judging from the interest which Wisconsin fruit exhibits have attracted at the State Fair recently, one must conclude that the importance of new fruits for Wisconsin is quite vital.

It will be by object merely to present the subject in a way to arouse a general and profitable discussion.

Professor Bailey in his "Evolution of our Native Fruits" asserts that much of the early improvement in American varieties was quite unintentional. Fruit was indispensible to the diet of the early settlers, and to satisfy their early needs they were compelled to rely upon the supply from native wild fruit. Thus what they thought to be only a temporary movement proved to be the beginning of a great commercial industry in this country.

In regard to the native plum, even down to comparatively recent years many of the well known varieties have been taken directly from wild plum thickets. In recent years the plum question has been presented in Wisconsin in two aspects: first, as a fruit adapted to the farm garden, and secondly, as adapted to commercial purposes. The native plum being especially hardy, men have worked with the object in view of producing varieties which should also compare in quality with the more tender European varieties. As a result, we find under cultivation upon many Wisconsin farms a few very excellent varieties.

Conceding that the native plum will produce regular crops at comparatively low cost, can it be depended upon to yield a constant and certain profit to the grower? Experience seems to show that only the very excellent varieties seem to fulfill these conditions. Many varieties are now under cultivation, which, although they may not yield a positive loss, will, nevertheless, lower the profits on more excellent varieties. A common condition of the market makes this result inevitable. The woods are full of wild plums, many of them of fairly good quality. During plum season this fruit is hastily and carelessly gathered by the farmers and turned in upon the market at whatever price the merchant chooses to pay. Outside competition is rife. Wild goose plums from Missouri, Japanese plums from California and Michigan arrive early in the season; Lombard plums they will also affect the ready sale of more excellent varieties. from Michigan reach Madison through the hands of the commission men and retail in the stores at 25 cts. a basket. Plums of only average quality must suffer under these conditions and Plums like Surprise and Wyant neatly packed can compete successfully with this outside competition.

The demands of the market and conditions of location, etc., must receive due consideration from the propagator in the improvement of varieties. He must be thoroughly conversant with the work other men are doing in the same line. Such information will lessen the liability of such uncalled for enthusiasm over varieties which never can attain commercial rank.

Several men of sound judgment looked over the exhibit of seedling fruits at Milwaukee last fall. There seemed to be noticeable harmony in the opinions of different individuals concerning the character of the ideal commercial plum for Wisconsin. Primarily, it must be a large, firm, fleshy plum of good quality and preferably red. It must have a durable skin, but tender and elastic. The varieties with a tough, tart skin are especially liable to crack in wet weather. If the plum has a small, free stone and is free from bitterness, astringency, and harshness, we have a plum that at least approaches the ideal. The judge laid great stress upon producing varieties of fleshy nature. These bladder like plums filled with delicious juice were utterly condemned for commercial purposes.

Early results from seedling plums were obtained from somewhat haphazard methods. Later methods of planting seeds from the best varieties only, seem to give more steady consistent improvement.

Cross fertilization is another field of work which seems to offer much encouragement in the improvement of Wisconsin plums. Indeed, there are men who believe this method will in a measure supplant the above mentioned method of natural selection. They believe that the horticulturist can more readily lay his hand upon desirable qualities in other species and then with some degree of accuracy, at least, breed them into the native varieties. The method requires some skill and patience, with the necessary attention to records and other details. Japanese and American plums can be readily crossed and this seems a most desirable field for investigation.

Japanese and European plums perished in Wisconsin last winter. On account of previous similar experiences most horticulturists believe these species absurd for Wisconsin. Nevertheless many pits from European varieties will be planted in Wisconsin next spring.

Reports from this Society seem to show that there is a general quest in the northwest for a seedling winter apple, of first class, which shall be adapted to northwestern conditions. Interest seems to be especially centered along this line in Wisconsin. Among the Station exhibits of seedling apples at Milwaukee was a row of McMahan seedlings, about twenty-five plates in length. The fruit showed a variation in size from a crab apple to apples approaching in size to the McMahan apple itself. About five of these seemed to demand further trial. A group of Haas seedlings showed a decided resemblance to the Haas apple. The largest seedling was a seedling of Repka Malenka of fairly good quality. Other seedlings of Walbridge and Fameuse were shown, all of which showed the most striking variation in type and flavor. Golden Russett seedlings were exhibited which seemed to have lost all trace of resemblance to the parent apple. An Oldenburg seedling of excellent quality and coming from the most prolific tree in the orchard was shown, but it was condemned because of size.

The results of work with apples are necessarily slower than those with the plum, owing to the later and more irregular bearing habit of the apple. The work is very important and very interesting and will undoubtedly be reported at the proper time by the proper person.

To a beginner in horticulture this work of improvement of varieties has proven extremely interesting. It does one good to rub up against these problems and the men who are trying to solve them. After realizing the difficulties one can readily understand how men who cause permanent advancement are placed among the country's benefactors. Even those who meet with only indifferent success have helped to foster an industry which showers its blessings upon millions.

DISCUSSION.

Mr. W. A. Toole: Mr. Chairman, the paper was an excellent one and I agree with the reader in everything except one point, and I must disagree with him on that. Comparison was made at one point by placing the Japanese and European plums together. I have no fault to find with the Japanese, but they have not passed through a hard winter, and I am going to do more with them than I have before. They have certainly gone through the winter better than the Domestica, but I did not realize until this evening that they had gone through so much better. The Japanese plums are of good keeping quality, but in the matter of taste they do not compare with our best native varieties. The native plum suits me better than the Domestica. It certainly gives us a good deal of encouragement.

Mr. W. S. Hager: My experience with the Japanese in regard to hardiness has been entirely satisfactory. There have not been very many grown in that part of the state, but just scattered trees, but the trees came through in perfect shape.

Mr. H. G. Street: I understand that this Ames plum is a cross between the Japanese and the Americana, and I would like to know how it is doing.

Mr. Milward: It is a large plum and it has a very fine rind, but it clings to the stone very firmly.

Mr. Street: How is the flavor?

Mr. Milward: Around the pit it is quite astringent, it has a very tough skin. In regard to the Japanese and European plum, I think there is a wrong impression. I did not mean to place them on the same plane in regard to hardiness. I meant to say that they had proved somewhat hardier and they had been crossed with the Americana plums. I believe, however, they froze oue in some places last winter.

Prof. Sandsten: Regarding the Ames plum, while it is a very good plum, the tree itself does not show that it has any Japanese blood in it, and while I do not wish to disappoint the man who introduced it as a cross, I believe there is a question whether it is a cross. My personal opinion is that the tree is not a cross. The tree is an impossible grower. You can trim it and you can prune it and it grows in a circle. I would not advise anybody to try to grow it. The fruit is of poor quality, but it is big.

The President: What is the best plum in the list?

Prof. Sandsten: The Surprise is the best we have.

Mr. Jos. Reek: In regard to the Ames plum, I have got it. It was recommended to me very highly and I have had it two years, and I was disappointed as the professor said, as it showed nothing of the Japanese blood. It stood last winter as well as any native variety. I think it is perfectly hardy.

Mr. W. A. Toole: I am glad we are not getting away from the consideration of our native plums. I know we are very partial in watching the work of our Experiment Station, and when I was at St. Louis we had plums to look at in other exhibits, but yet our own plums awakened a great deal of interest among the people of the city. I did not care whether they called them wild plums as long as they were interested. People would ask if the commission men could not get them another year. I sold some plums in Milwaukee and I sent them some Lombard in place of what I had sent them the year before, and they were very sadly disappointed because I had not sent them the natives.

The President: We would like to have Mr. Underwood tell us what they think of the Americana in Minnesota.

Mr. Roy Underwood (Minn.): I was promised a little space on the program tomorrow morning to speak on this topic, but I am glad to have the opportunity of bringing the matter up now. In Minnesota we give the Americana plum the most important place. None of the Domestica and foreign plums are in any way hardy enough practically in our state. At Lake City, where I live, we have a few scattered instances of people fruiting such plums as the Abundance, Arctic and a few others with success, but not for a very long time. Sooner or later we will get one of those cold winters with bare ground that kills them out. So we look forward to our native plums to furnish us what we require in our cold state. As the gentleman who read the able paper stated, many good things have come from your state over here, and we look with even greater anticipation toward the plum as a lucrative field for investigation than the apple, because it stands to reason that inasmuch as the plum is a native fruit here, and you find good varieties growing wild, we shall look for quicker results in the adaptation of the plum to our soil and climate and the production of really good marketable varieties, than we can expect to find in the apple, and for this reason our nursery department is about to offer a prize of $1,000 for a good native plum. There are to be some qualifications that will be necessary in order to entitle the plum to such an award, but they will not be many in number. Our State Horticultural Society three years ago offered a prize of $1,000 for a seedling apple, something that would combine hardiness and keeping qualities, and while we have not yet brought forth that apple, still it is surprising to note the number of seedlings offered in competition and the marked superiority of the seedlings brought forward each year over those of the preceding year, and I do not think it is assuming too much to suppose that in a few years time we shall have an apple that will be hardy in Minnesota, as hardy as the Duchess, as prolific as the Hibernal and of as good a quality as the Wealthy. I believe this action of the Society will bring forth seedling apples that are in time going to give us something that will supply our markets with late winter keepers, something that will compete with the apples that are now grown in the south and east.

Now in regard to the plum, we are open at the present time to suggestions. We want to know and we are especially interested in hearing from our Wisconsin friends as to what they think should be the qualifications of this prize plum. I don't know any better way to get at it than this: If you were tree men and wanted to get a variety of plums to offer to your patrons over the northwest and the western part of Wisconsin and the state of Minnesota, what qualifications would you consider necessary to entitle the plum to that prize of one thousand dollars?

I may also say we are going to offer a prize of $1,000 for a cherry. I might as well bunch the two statements together. We have a hybrid cherry growing in Minnesota, known as the Compass cherry, which is a cross between a cherry and a plum.

It is a true cross between the sand cherry and the Miner plum. It is a very hardy tree, in fact, just as hardy as the Surprise and native plums. The bark, fruit buds and leaves are something like the cherry. The fruit is as near a mixture of the small wild plum, of the Domestica type, and the sand cherry as it is possible to secure. The fruit is not first class in quality, but we have sold a good many thousand trees in the country, and people are well pleased with it because it provides them with fruit where it has been impossible to produce anything. It is not of as good a quality as the Early Richmond. We want a cherry as good as the Early Richmond and as hardy as the native plum.

I hope I have not taken up too much of your time, and I would be glad to have you now or at any time make suggestions in regard to the qualifications we should impose upon this variety that we are seeking after.

Mr W. A. Toole: I think the members of the Society had better be going after that plum. I would like to ask whether it should be an eating plum or a cooking plum. I have reasons for asking that question.

Mr. Underwood: In response to that question, at the last meeting of our Minnesota Horticultural Society, Mr. Loring, a prominent citizen of Minneapolis who is greatly interested in this subject, offered a prize of $100 for a new seedling plum, its qualifications to be determined by a committee consisting of Wyman Elliott and one or two other members. They got together and made up quite a lengthy list of qualifications for this plum, and when we brought forth this offer we wrote to the committee and to the Secretary of the Society and gathered together all th eideas we could, and we now have the qualifications in this form. I will read them to you to give you an idea of what we are seeking after. We are not going to publish these qualifications until we get them definitely fixed: "Tree vigorous and as hardy as the Surprise and an annual bearer. Must ripen before September 15 in Minnesota." We are liable to have frost by that time, severe frost. "Fruit must average 1¾ inches in diameter." I am told this is too big, but we put that size in because the committee of the Horticultural Society named that size on this $100 offer. "The quality must be without astringency, as sweet as the Ocheeda, flesh firm when ripe and the pit no larger than the De Sota." Those are practically the qualifications that have been offered by the Minnesota Society.

Mr. W. A. Toole: You will find that plum will not come up to those qualifications. We like the Wyant very well, but the Cheney is much better.

The President: I am a little like the old maid who did not know how old she was. I understand the leading plum man said the Surprise was the leading plum.

Mr. A. D. Barnes: I want to commend our Minnesota friends for not putting in a color qualification.

Mr. Underwood: The Society did specify a red color, but our department did not care whether it was red or blue in color.

The President: It will be golden if it gets the thousand dollar prize. (Laughter.)

The President: In the absence of one of the speakers I have allowed this plum discussion to come in. I have called down Mr. Underwood and Mr. Toole, and if Mr. Toole gets up again I will call him down again. (Laughter.)

Dr. Loope: I am taking lessons from the chair. I would like to know the best four varieties of the Americana plum. I don't want you to misunderstand me. I don't want anybody to mention a dozen varieties to plant. It doesn't pay. If anybody wants them for himself he wants only four varieties, he does not want fifteen or twenty varieties of plums. I want to know the four best varieties, or five at the outside. I don't know anything. I want to know whether it is the Wyant, Quaker, Stoddard or something of that kind. I want to know something about the Americana. The one question of the hardiness of the Japanese or European varieties is a mixed question in the state of Wisconsin. We all know that the Japanese or European varieties are sold as far north as Sturgeon Bay, and in the vicinity of Oshkosh they kill almost any winter. They do not kill at Sturgeon Bay, and they do kill in the southern part of the state, so I don't want any misunderstanding about it, they have got to be hardy throughout the state. I would like a list that may go out as being thoroughly reliable, a list of four or five of the best Americana plums to plant.

The Chairman: You will know more about the hardiness when spring opens.

Prof. Sandsten: Mr. Chairman, I have spoken once already on the plum question. I would place the Surprise at the head of the lits, after that I am a little mixed, perhaps the Wyant and the Hammer. I have one or two more that I prefer for the quality. I like the Penning's Peach and the Ocheeda.

The Chairman: L. G. Kellogg, give us your preference.

Mr. L. G. Kellogg: What little experience I have had with the native or Americana plums I would place the varieties in this order: Surprise first, Wyant second, De Sota third, and Hawkeye fourth.

Mr. Cranefield: In the order of their excellence, Surprise, Wyant, Quaker and Hammer. I have known them all for fifteen years except the Surprise.

Mr. Coe: I would name the Surprise, Wyant, Hammer and De Sota in their order.

Mr. Bingham: I don't know anthing about the native plum. We find with us the Wyant is very unsatisfactory in not being able to get it to fruit. We have them five years old and they have never borne with us; we don't know what is the matter. We have the Hawkeye and the De Sota and we find them very good, but the Wyant seems to be very different.

Mr. Millard: Are you not losing sight of one quality the gentleman from Minnesota mentioned. The plum has got to be a firm plum. If you eat it out of hand it is different, but to stand commercial conditions it has got to be a firm plum.

Mr. H. G. Street (Ill.): Is the Surprise solid enough for that purpose?

Mr. Cranefield: Yes, sir.

Mr. Twombley: We had a little experience with the Hammer plum. Some of them are just living and this spring most of them will be dead.

Mr. Anderson (Iowa): The conditions in Iowa would not be the same as in Wisconsin. As to the varieties that are doing best with us I should place the Wyant ahead of the Surprise. I have had the Surprise for several years and I have never seen any fruit. I understand it is somewhat a shy bearer. It is not as good a bearer as others we have down there. The Wyant is conceded to be the best for our country. The Hawkeye is good for a market plum. The Hawkeye and the Stoddard are nearly alike. The quality is not so good for eating out of hand, but for canning it is good and for selling it is as good as anything else. For quality of fruit the De Sota is good, but the Hammer is nearly as good as the De Sota, but the appearance is not so attractive as that of some of the others. The Miner generally takes fourth place on account of being later than the others, but it is quite a nice plum, not solid, but being late would perhaps recommend it for northern Wisconsin.

Mr. Converse: When that question was asked I had in mind the Forest Garden, Wyant, De Sota and Surprise.

Mr. C. A. Hatch: I don't want any plums at all, so I could not give you any list.

CRANBERRY CULTURE IN WISCONSIN.

O. G. Malde.

Although the word "cranberry" has long been associated with the turkey, as a much relished dish on our national day of Thanksgiving, the culture of the berry by man dates back but a few years and marks a new epoch in intensified horticulture.

Of the true cranberry, as is probably known, there are but two species in North America. Of the two species but one, the large cranberry (Oxycoccus macrocarpus) is cultivated.

The cranberry culture of Wisconsin dates back but about thirty years, and all cranberries gathered prior to that time were from the wild marsh. This early gathering of berries from the wild marsh was quite a complicated affair, as the farmers living about the marshes and knowing of the whereabouts of the best yielding vines would move out and camp on some little elevated spot near the patch and keep guard over it. In this way a form of "squatter sovereignty" was taken over the different parts of the marsh and this was even carried so far in some cases as to use the shot-gun to eject anyone who might want to camp on the same elevation or island. During the latter years of this "squatter sovereignty" the competition became so great that the state had to pass a law forbidding anyone from picking cranberries on the wild marshes belonging to the state before the first Monday in September, as the competition caused them to commence picking so early in the fall that the berries were but partially matured.

A large number of barrels of berries were harvested each year from the wild marshes. The Carey family of Berlin one year gathered as many as five thousand barrels from their wild marsh; then others, seeing what might be done, commenced to take up the state lands that had the wild vines on, and a rudimentary system of irrigation was commenced. Thus the business flourished for a few years in this rudimentary way, then came a series of dry years with fires; the largest part of the vine-covered marshes were devastated, the business took a drop, and many of the owners let the land go back to the state for the taxes, as they did not have the back-bone and staying qualities to hold out during the dry times.

Meanwhile, others who had kept their eyes open and watched the few who stayed by the business, stepped in and secured the abandoned lands by paying the taxes, and commenced to ditch up and put in the marsh on a more systematic plan with regard to protection from frost, and it is this system which is in operation in the cranberry districts of the state to-day, and dates back to about the year 1885, though the real impetus of the business dates back to the very recent date 1894, which was the year of the last fire that harassed the industry and brought out several more improvements along the line of irrigation and reserve water supply.

Cranberry culture to-day is chiefly carried on on the peat-bog, though a few sanded marshes are operated with good success. The maintenance of the peat marsh is a much easier matter than that of the sanded marsh, as the ditches and dams used on these retain their shape much better. The peat marsh, after a couple of years of vine growth, is in many cases sanded a little each year. The sanding is usually done in the winter, when it is easy to get about the marsh, and the use of the sleigh also adds to the convenience and cheapness. About three inches of sand are usually applied.

The general operations of preparing a marsh for cranberry vines are as follows: Scalping, cross-cutting, picking up of the scalpings and placing these into dams, ditching and leveling. Then comes the planting and the maintenance of the plantation up to the time of fruiting and harvesting. If these operations have been thoroughly done, a half crop should be obtained the third year. It is about this time that the sanding referred to should be done. The fourth year a fair crop may be expected from the planting. In the fifth year a full crop should be obtained.

To go into details of the different steps mentioned in the operation of preparing a marsh would require an extensive paper and will therefore be omitted, as the parties most interested can find literature on the subject.

The picking season is a very interesting one on the marsh and lasts from two to four weeks, followed, after a lapse of two weeks, by the picking-over season of from ten to twenty days.

The precedence established by the law that restrained early picking on the wild marshes a few years back seems still to be recognized, as the first Monday in September is marked by the coming of the pickers from the farming regions about the marsh and near-by towns, who locate in the shanties which have been erected on the marshes for the accommodation of the pickers. These shanties have tables, benches, and a cook-stove on the first floor, where the cooking is done. On the second floor are the sleeping quarters, provided with two-story bunks. The pickers furnish their own bedding.

The Oneida and Winnebago tribes of Indians also appear on the scene at this season. The Oneidas are furnished shanties apart from those of the whites. The Winnebagos, who are of a mort roving nature, pitch their wigwams, in which they live.

The choice berries and heaviest yielding sections of the marsh are generally picked by hand. Women and children, squaws and papooses are employed at this, and they are paid about fifty cents per bushel, two and three bushels being a day's work for an adult, except in exceptional cases, when this amount is exceeded. The pickers are paid by the ticket system. These tickets are accepted at the store, one of which is maintained on each marsh during the season for the accommodation of the pickers. The final settlements come at the end of the season. The poorest yielding sections are harvested with the rake, and for this purpose the strong men, both white men and Indians, are employed, receiving from one and a half to two and a half dollars per day and their board, or fifty cents more if they board themselves. The rakers harvest from eight to twenty bushels per day, according to the yield of the sections raked.

All berries harvested during the day are to be housed before the teamsters quit at night. These berries are emptied from the boxes into which they were harvested, into flats four and one-half by two and one-half feet by six inches; these boxes are placed in tiers and the berries left to dry about two weeks. The time varies somewhat according to the market. Cleaning and grading is done just before berries are barreled and shipped, to facilitate the work.

When the berries have been stored long enough for the chaff and refuse which have been gathered with them to dry, or when the market demands it, cleaning and grading commence. Though it may seem queer, it is nevertheless a fact that the process of cleaning and grading differs on each marsh, as practically each owner has a machine of his own make, although all the cleaning and grading machines are designed to do the work according to two general principles, namely: to grade by passing over sections of screens varying one thirty-second of an inch, and on the separation of the sound from the unsound berries by descending a series of steps, where, the sound berries having much elasticity, they leap a pit-fall and appear on the hand-picking table, while the unsound berries, having lost their elasticity, do not escape the pit-fall but drop into the slush box. The berries that appear on the hand-picking table soon encounter the tiny fingers of some fair damsel that are trying to detect any unsound berries that might have succeeded in coming down with the sound ones. The berries are graded into four grades, namely: the pie, standard, fancy, and extra fancy or choice berries. The standard contains the bulk of the berries, with the pie and fancy next, as there are but few choice ones. The berries are passed from this picking-over table into barrels; these are immediately headed and taken to the car which is waiting for them at the station and placed there through the commission man buying them. These cars are dispatched to some commercial center from which the barrels are distributed to the grocers, and when we next see our Wisconsin grown cranberries they are perhaps made into some delicious sauce, served alongside the roasted turkey on some elaborately set Thanksgiving dinner-table.

DISCUSSION.

Prof. Sandsten: Mr. Whittlesey is one of our prominent cranberry growers of the state and is Vice President of the Cranberry Growers' Association. I think we would all be pleased to hear from him on this subject.

Mr. Whittlesey: Now I am in trouble. I am not a happy speech maker and I don't know what on earth to say to you. I have been in the cranberry business a long time and I ought to know how to grow cranberries, but I confess I do not, and I don't believe any cranberry grower does. (Laughter.) It is a business we know as little about as any line of business I know of. The state under the direction of Dean Henry, and more directly Profs. Sandsten and Whitson, came up in my neighborhood and started an experiment station, and they have learned in a couple of years about all that we know, and now we expect to get our knowledge from them. Cranberry growing is considerable of a business. It is a business worthy of respect. I think Judge Gaynor who is here has gone over all that perhaps; anyway, he is the best known, and you who were here this afternoon heard him speak. I would be glad to answer any questions you may wish to ask.

Mr. Utter: Does the cranberry thrive by using a fertilizer?

Mr. Whittlesey: Yes, but we are not doing anything of that kind in Wisconsin. It is largely practiced around Cape Cod.

Prof. Sandsten: Phosphoric acid in some form seems to be necessary. It seems they require a small amount of phosphoric acid together with a small amount of potash.

Mr. Whittlesey: No fertilizer has been used in Wisconsin, but it might be used to great advantage.

Mr. J. J. Menn: What do you consider a full crop?

Mr. Whittlesey: I have known 500 bushels grown on a single acre, but 100 bushels is a large yield, and a good average yield on a well cultivated patch is 25 barrels or 75 bushels to the acre.

Mr. Nicolai: Can cranberries be grown successfully in the southern part of the state?

Mr. Whittlesey: It requires sand, soft water and a peat or muck marsh. I think if the conditions are right the latitude in the southern part of Wisconsin is all right.

Mr. Nicolai: Will they thrive in lime water?

Mr. Whittlesey: No, sir, they must have soft water.

THE COMMISSION MAN AND THE FRUIT GROWER.

B. E. Feldkamp.

A good fruit grower, who has confidence in, and the confidence of, his commission house, and who grades and packs his fruit carefully, honestly and correctly, is a valuable asset of any commission house, and as such, is always wanted. Many growers have no confidence in their commission house and sent consignments to several firms in the same town, or, if they stay by one firm, they send in a volley of "kicks" after each consignment. They ship to two firms on the principle of setting a thief to catch a thief, the one making the lowest returns being the thief, or they have no faith in the ability of one firm to handle their consignment promptly, and think to expedite matters by dividing it between two. The actual results are far different from those expected. In the first instance the dishonest man is not discovered because the fruit might have arrived at different times of the day, although shipped at the same time there might have been some inferior packages in one of the lots, or some other of the numerous causes influencing the price may have intervened; in the second case there is a certain market,—a certain vacancy, so to speak,—to be filled; the firms are competing and are covering the same territory, so it is but reasonable to suppose that party "A" could have filled this vacuum as well as party "B." What the shipper has really succeeded in doing is to make his own goods compete, to furnish the weapons by which rival firms cut prices, the grower, like the innocent bystander, being the one injured. And then there is the "kicker." Some men seem to fail to realize that a commission firm will always try to get the highest price possible, because the higher the price they receive the greater will be their profits. Everyone must admit that there are dishonest commission firms, and because these houses do not make full returns the "kicker" thinks all commission firms are dishonest. If a man is dissatisfied he should try a new commission house, and if there is no commission house in his market that he can trust, he should hunt up a new market. In the case of the species of man just mentioned, the chances are that no one would object to the change.

In order to establish confidence between the commission house and the grower they must come closer together than they are at present. Both parties are to blame for existing conditions. A grower seldom writes to the firm; some of them do not even acknowledge the receipt of a cheque. On the other hand, commission houses do not like to mail statements of market prices because of the expense involved; the grower gets as much benefit from such reports as the commission house and he should bear his share of the expense, but in just what manner this can be accomplished is a question. If the grower is kept informed he will know to what markets he should send his fruit and what markets he should avoid. Such information will prevent the glutting of one market, while another, thirty or forty miles away is demanding more fruit. If the flooding of a market is lessened in this way by proper distribution, larger returns to the farmer and larger profits to the commission house will result. In this state there is a melon grower who well realizes the importance of getting his melons in the market at the right time. This man, last summer, had a telephone line constructed to his field from a small town about three miles away. By means of this telephone he was kept informed of market conditions in a certain city some thirty miles away. When the demand was large and prices going up, he was notified by his commission firm, and immediately rushed in a car, which he could do in about twelve hours. His estimate of the profits during the season due directly to the information received over the telephone is $2,000.00. In the reports that commission houses now send out, the highest market price is often quoted, due sometimes to a deliberate attempt to deceive, but more often to the fact that such circulars, especially if printed, are intended primarily for the customers of the firm, not its shippers; so care should be taken in placing reliance on these printed reports. Information intended especially for the grower is usually mimeographed.

Proper grading and packing is necessary to secure a good return and profit on any fruit. By "proper" is meant, not fine packing, but packing that is suitable to the kind and condition of the fruit. Laxness in this matter is unfortunately the rule today, and, when urged to do better, most men say that it would not pay, failing to see the difference between proper packing and fine packing. Good packing pays only on good fruit, and is a waste on poor fruit. This unfitness of the package to the fruit is what is meant when present conditions are deplored. Most men go either to one extreme or the other. With the investment of a little thought the proper medium can be reached, and such an investment will pay big dividends. This same case occurs in regard to spraying; party "A" never sprays, and the bugs and scales hold a carnival on his farm while he pays the expenses of the crowd; party "B" sprays; he doesn't know exactly why but he is—well, spraying,—and he calls himself an up-to-date fruit grower.

The arrival of fruit in the market in proper condition is something that should be looked forward to even when the trees or bushes are planted, and varieties that ship well should be [illegible] For [illegible] the grower in planting varieties that are not productive, [illegible] the fruit of which is in bad shape when it reaches the market. It would be far better to have less fruit but of better kind and quality. Inferior or soft fruit will be sold only to peddlers and other classes that pay but little. Any kind of produce should reach the market at a time of the week when it does not have to lay over and get soft, as it may if it gets in late Saturday forenoon or afternoon; and for the same reason it is best to have fruit arrive before 7 A. M., the greater part of the day's business is transacted before that time. Never try to cheat a commission man, for it can't be done. If you have a [illegible] brought to the effect that you have discovered something different, then remember that there is nothing new under the sun, and that your commission house has, probably, met it many times before. The commission man also has the last trick and whatever happens he must and will protect himself.

The standard package for apples is the [illegible]-quart barrel, which is practically the same as the ordinary flour barrel and the latter is usually used by small growers. Care should always be taken to have the barrel free from the slightest trace of flour. The 24-quart case is the standard for all berries and cherries, and, as in the case of the flour barrel, it should always be new looking and perfectly clean. Never use oil stained berry boxes. Pears are usually shipped in barrels though it is often profitable to ship them in bushel baskets with a lid corresponding. The ten-pound grape baskets holding eight pounds are always demanded for Concords, and the baskets are shipped loose. New York Niagaras and Delawares are shipped west, crated, in four pound baskets, but it is doubtful whether it would pay to use these small baskets for home grown grapes. Sometimes extra fancy fruit will attract attention and bring a higher price by packing in a package out of the ordinary, but a step in this direction should be taken with caution.

All packages of first class fruit should be plainly marked with the grower's name and address, and a label of some kind, possibly, guaranteeing the fruit. Waugh, in his book on fruit harvesting and marketing, has the following to say on this subject: "Very much of the grower's success depends on making a reputation for his fruit,—much more than is commonly supposed. The man who ships to the city market frequently imagines that his identity is lost sight of and his responsibility swallowed up in the mixture of all men's products in the commission house. This may be the case to some extent, but it need not be so at all. If the grower has any expectation of staying in the business and any ambition to make what money he can out of it, it will be much better for him to maintain his own responsibility for his own fruit, and get all the credit he can out of it."

A reputation is easily established and grocers and other buyers will look for your name and buy your goods on the strength of its being on the box. This will help eliminate competition and will make a ready sale for your goods. If your commission house sends a rubber stamp or a stencil, bearing their name and address, and a number by which you are known, expecting in this way to prevent their competitors from discovering their shippers, use it, but put your name on in addition. If your fruit is up to grade in every way they will not complain, because they want your custom.

Thursday Morning.

PLANT BREEDING.

Prof. E. P. Sandsten.

Mr. President, and Members of the Association:

I had intended to read a paper and I have a paper in my pocket, but I do not think it best to read it, because I do not understand part of the paper myself, so I think I had better do a little talking.

The subject of plant breeding is one about which we like to talk a great deal, and we try to make out that we know something about it, but the fact is we know very little about it. We talk about heredity, about reversion, atavism and prepotency and the like, but if we are pinned right down to the facts we have to admit that we know very little about these terms and what they stand for. We have formulated certain laws which we suppose to be true under given conditions, but we find these laws are violated right along and hence we are not sure of the results. When we are dealing with life, in whatever form it may be, we are dealing with a complex formula that we cannot understand, but which we would like to understand.

You will pardon me for rambling over the subject, as I will have to do this morning, but I want to call your attention to the fact that plant breeding and animal breeding are governed by the same biological laws, and that the difference between plants and animals, while important to scientists, and to the students in general it is less important when we deal with fundamental principles, like the principles of heredity and reproduction. In these two respects the two kingdoms, plant and animal are almost alike, if not identical. So do not think for a moment that you are dealing with different problems when you are dealing with animals and plants.

What has interested me most the last two years has been the subject of Mendel's law. I have read a great deal about Mendel's law and have read the discussion that has been carried on on the subject in the current scientific journals. We have found that in breeding plants or animals the progeny will follow certain lines; it will resemble one parent or the other, or be neutral between the two parents. This discovery was made by Mendel in breeding peas and beans, and we now have the results in the shape of Mendel's law. To illustrate, if we have two plants or two fruits, like the Rhode Island Greening and the Snow apple, two distinct types, essentially different. The one is a green apple, and the other, the Snow, is red with white meat. If we were to breed these two types of fruit, the Snow and the Rhode Island Greening, the result would be three types of fruit. According to Mendel's law we would then have twenty-five per cent that would resemble the Snow, twenty-five per cent that would resemble the Greening, and fifty per cent would be intermediate, or would show character intermediate which would be intermediate. The first twenty-five per cent we would call dominant, that is, the strongest characteristic of one or the other fruits. The fifty per cent, we would call the intermediate, having characteristics intermediate between the Rhode Island Greening and the Snow, and the other twenty-five per cent would be recessive. Now we raise seedlings from the dominant and the recessives we should find that these two we breed true to type, while the intermediate would follow the same proportion of 25, 50 and 25 per cent, and the 25 dominant and the 25 recessive would again breed true from seed. This is the Mendel law stated simply, but we have in this case selected only one characteristic or unit character and you know there are a number of them, and that is why the breeding problem becomes more complicated. It is possible to take two varieties of fruit of a well defined type, cross the two and get a definite result. The law seems to follow the proportion previously stated right straight through. The proportion may vary a little but in the long run they follow it closely. If we have a number of parental characteristics in breeding we will naturally get different and indeterminate results. If we were to take these twenty-five that are pure and cross them with the original Greening apple what result would we get? We will have a proposition something like this: It will produce the two new types again, and the same indefinite number of fifty which we have called intermediate.

While great progress has been made in plant breeding, especially through the researches and discoveries of Mendel, De Vrie, and others, by the use of what is termed the "statistical method," much data of great theoretical if not practical value has been presented by a number of investigators along botanical and zoological lines. Especially has the study of the development and processes of cell division before and after fertilization been most fruitful. We are now able to follow the complex phenomena taking place in the fertilized cell, the segmentation and fusion of the cell or sex elements, and the subsequent development of the new organism. These lines of research have been carried on almost simultaneously with both animals and plants.

Plant breeding is governed by the same biological laws as animal breeding. The differences between animals and plants, while important to the morphologist and general students in science, are less important when we deal with purely fundamental principles, like those of sexual reproduction and heredity. Ever since the invention of the microscope, the cell has been considered as the unite of structure in both animals and plants. The differences in cells of the two kingdoms may be great from many points of view, but the internal processes of growth and reproduction are closely related, if not identical. First, let us consider the probable history and origin of sex in animals as well as in plants. In the lowest forms of organic life, where the whole organism is composed of a single cell, the presence of sex is not known, or at least not well marked; in fact, the presence is disputed by most scientists. Here the increase in number of individuals is accomplished by the mere division of the original cell into two or more daughter cells. This process is repeated indefinitely. It will thus be seen that the original cell reappears in all subsequent generations and we may say lives forever. As we advance the scale of development, differentiation in structure, both vegetative and reproductive takes place. At first this differentiation is, to be sure, very crude and difficult to trace, but nevertheless the progression becomes more and more plain as we ascend the scale of development. With the appearance of sex in plants, the parent plant or plants perish, unlike the original undifferentiated cell. Thus it will be seen that the presence of sex in the animal and plant kingdom is an acquired character necessary for the development of the plant phylum. The importance of sex in the plant and animal kingdoms is beginning to be more and more appreciated by students and investigators. Without it there could have been no evolution, at least not an evolution in the sense in which we understand it today.

Referring back again to the original cell, where, as previously stated, the simple division into two or more daughter cells simply meant an equal division of the original cell contents with all its attributes and characteristics, very few new influences could be brought into activity, but with the introduction of sex and with the appearance of death in plant and animal development, new forces were added. To those who bemourn the inevitable death of the individual a word of comfort should be given. Death, as we are beginning to understand it, is an acquired character that was unknown and is unknown in the lowest forms of life. Without the appearance of death evolution could not have been possible, or if possible, would have been greatly retarded, and progress along all lines or organic life would have been slow, if not impossible. The all prevailing belief in a personal and bodily immortality, as such, finds its answer, demonstration and inspiration in the lowest forms of life, though in the higher forms the death of the parent form is necessary to the march of progress.

Having thus slightly touched upon the subjects of death and sex as important factors in plant and animal evolution, and their relation to plant and and animal breeding, we may endeavor to trace the phenomena of cell division and growth in the fertilized cell and to try to correlate, if possible, the changes that take place in the cell with our present conception of heredity or the transmission of characters. Before so doing, I cannot forego to say a few words about the question of transmittibility of acquired character, or, in other words, whether characters acquired during the life-time of the individual are transmitted to the offspring. This is denied by the Neo-Darwinians. The position taken by the Lamarckian school is generally supported by horticulturists and botanists, with few exceptions, while the Neo-Darwinian side is upheld generally by zoologists. Ever since Dr. Weisman formulated his theories of the localization of the germ plasms in certain cells of the organism has the battle between the two schools been waged with considerable bitterness. Later investigations by Weisman himself and others have somewhat modified our old lines of reasoning upon this subject, and seemingly a common ground between the disputants has been reached.

Popularly, the stamens are considered as the male and the pistils as the female organs of plants. This conception, while convenient, is erroneous. Stamens and pistils are modified leaf structures. The pollen grains are true spores. When the pollen grain alights upon the stigma of the pistil, it germinates and grows into a long, slender, tube-like plant. This small plant should be considered as parasitic on the pistil. It grows downward until it comes into contact with the cell wall of the egg cell, which it penetrates, and emits a fecundating nucleus or sperm. The immediate effect of the fusion of the sperm with the egg is an increase in size. Meanwhile, internal changes take place. The nucleus of the egg cell and the nucleus of the sperm begin to segmentate into rod-like bodies called chromosomes. The chromosomes of the sperm and those of the egg lie side by side. The next stage is the fusion of the two respective sets of chromosomes, leaving only one set. These again separate, apparently in the same manner as they fused, resulting in a probable mixing of the two sex elements. It is reasonable to suppose that these chromosomes become modified as a result of the fusion, and with the development of the new individual become distributed into every cell of the plant structure. Researches have established the fact that the two sets of chromosome bodies (corresponding to the male and female inheritance) are present in the cell through all stages of cell division and growth and should be considered as the physical basis of heredity.

Thus it would seem that the most tenable heredity units in organic life are the chromosome bodies as they appear before fusing in the egg cell. The preponderance of character and hereditary traits of the two sets of chromosomes must determine the relative preponderance of each parent after fusion. Of course it cannot be revealed what part of the respective chromosomes enters into the fusion and into the subsequent segmentation after the fusion. The process which takes place immediately after the fusion of the respective chromosomes is a matter of speculation, but greatly important to the student of heredity. It is reasonable to suppose that strength of character as influenced by physical vigor and a long line of ancestors would determine the character or influence the character of the new offspring in a considerable degree. The relative importance of different hereditary traits of character as opposed to each other would determine what the offspring would be. While these studies are interesting to the student of breeding, they furnish after all no tenable clue apart from speculation as to the ultimate processes that take place in the cell, and it is to be doubted whether subsequent studies along this line will yield very satisfactory or conclusive results. Perhaps the statistical methods as now in vogue will yield much greater results if breeding follows strict laws, as we now believe, and which would appear from the study of cell division after fecundation has taken place. The great benefit derived from the study of hereditary laws from a botanical point of view is the accumulation of new facts upon the initial processes of the transmission of hereditary traits, since all intelligent breeding must finally rest upon such knowledge. The studies thus confirm the conception held by early breeders of animals that a pedigree was absolutely necessary for the best results in all long lines of breeding, and that the sporadic cases of excellency obtained by indiscriminate breeding proved the rule with exceptions. So, in order to predict results in breeding or in predicting hereditary laws the breeder must know the antecedent of the organism involved. Undoubtedly the statistical methods of breeding formulated by Mendel point to this conclusion. The purer the strain of two individuals, the surer can we predict what the offspring will be, for in these cases there is a homogenity in the two parents and the respective forces become correlated and dominant. But who shall predict the direction of heredity when the two parents are of unknown breeding or antecedents? The result must necessarily remain a puzzle. If, then, the discussion has proven that very little progress has been made in the practical field of breeding, it must not be said that progress has not been made. We have at least been furnished with a formula that will guide us in future work. From this formula we can predicate with a reasonable degree of accuracy results which before we were unable to predicate. But apart from such formula the great field of breeding will still lie open for the enthusiasts. While the greater number of breeders may follow the definite rules and laws formulated by the statistical methods, there will be a few, who, unhampered and unbound by such rules and laws, will launch out and now and then obtain results which will be of inestimable value to the race.

Extensive experiments have been carried on with peas, beans and cereals to test Mendel's law. The results so far reported show that the law holds good but not with the exact limits. The reason for this difference may be due to the difficulty of choosing unit characters or characters well fixed and defined. The animal breeders seem to have come nearer the law than the plant breeders, possibly because the parents have permanently fixed unit characters, and also because the animal breeder can better control the external conditions.

In listening to the discussion in the Society last year, the question was asked: "By what external marks can we tell whether an animal or a plant is prepotent?" The question simply indicates the desire to learn something of a quality that does not necessarily give any indication on the exterior. If we refer back to line breeding and statistical methods of deducting results, we may predicate from a given individual its power of prepotency. But whether external conditions exist which point to this characteristic or not is a question that I think no one at the present ventures to answer. I believe that such power is necessarily situated in the germ plasm and is hereditary and as such would not necessarily give external evidence. Still we are seeking something that is tenable, something we can see with our eyes. We deny things that are unseen and unreal and untenable, but let us not forget that in dealing with life in its various manifestations we are dealing with an unknown force, of which we know nothing save its manifestations. Its essence is hidden from us.

The question is often asked: "How can we account for atavism?" "Why is it that after a number of generations of pure breeding there suddenly appears a "sport" or an offspring entirely different from the parents or grandparents?" I think that this question may be answered by referring back to the study of the fertilized cell and the fusion of the two sex elements and their subsequent division. We can easily conceive that in the cells have been transmitted a number of generations and that certain characteristics have been present from the beginning, but due to the preponderance of other characteristics have not appeared in the offspring, but have remained latent or recessive. These latent or recessive characters will appear when given an opportunity, and such opportunity may occur after a number of years.

DISCUSSION.

Mr. Wm. Toole: I suppose this Mendel's law is based on the idea of making this cross of the two varieties for each one reasonably true. There might be one variety or the other reasonably true, but when it comes to this matter of apples, when we take into consideration the chance pollenization by bees and all sorts of things, would not the law be very badly broken when applied to apple trees?

Professor Sandsten: It would not, if we take into consideration two things in the choice of parents of marked characteristics. Take the question of color, if we consider the color of the Rhode Island Greening and the white meated Snow apple. Now Mendel's law would make the white meat appear in the other apple. Supposing those were proimnent characteristics in the two and were fixed, then Mendel's law would make twenty-five per cent of the white meat and green skin, resembling externally the Rhode Island Greening, and fifty per cent that would be intermediate, and twenty-five per cent would have white flesh and red skin. There are the only two characteristics that we have taken into consideration, because if we take everything into consideration the problem becomes too complex to figure it out. It is only along certain lines of breeding you can make use of the law such as fixing the color and meat of the apple. We would have to go through a long series of breeding to get all the characteristics.

Mr. A. D. Barnes: Which is the most likely to favor the reproduction of the variety, the mother blossom or the father blossom with which the other blossom is fertilized?

Professor Sandsten: I don't know; I don't think anyone can answer that question. I think that depends entirely on the individual. I don't think the father has any advantage over the mother, except in so far as strength and prepotency are concerned.

Mr. Toole: The sex from which the pollen comes, has that any bearing on the subject?

Professor Sandsten: It makes no difference which is the male or the female parent.

Mr. Underwood (Minn.): Does this refer also to the quality of the fruit? Will that come out in the same proportion as the parent of the tree?

Professor Sandsten: That is a question we cannot determine. It is only marked characteristics we are looking for. If those varieties have other characteristics they may not appear, they may not come out in the same proportion.

Mr. A. D. Barnes: The trees are nearly identical in the tree form.

Professor Sandsten: They are nearly alike. If you are breeding for a particular quality of Rhode Island Greening you could use a Rhode Island Greening for that particular quality, and if you are breeding for a particular quality of Snow apple you can breed from the Snow apple, and in that way you can follow out all the other characteristics of the varieties.

Mr. C. A. Hatch: If you were breeding the Snow apple, after the first cross you have 25, 50 and 25 per cent of the characteristics you mentioned, what per cent would you take for your next cross?

Professor Sandsten: Those twenty-five on either side would breed true, but in the case of apples we do not breed in that particular line. After we get a variety we propagate by grafting or budding, so the problem would not come up, but in cereal breeding it is used to a great extent, but in this case Mendel's law is not absolute, it will not fall exactly in that proportion. It may be 27 or 35 or it may be 40 in a case, so the result will not be definite except when large numbers are taken, then the number is fairly accurate.

Dr. Loope: Do you protect blossoms in making a cross?

Professor Sandsten: Oh, yes, always. Now in breeding fruit or in pollenating our idea of sex in fruit is somewhat hazy. Among fruit growers are those who have not had opportunity to look into the problem more thoroughly. We speak of the pollen of the fruit as the male. That is only slightly true. The pollen is the true spore, just like spores of the smut, the pollen when lighting on the stigma starts the germination, like the kernel of wheat it starts to grow into a long, slender tube-like plant that grows dowward to the pistil, and then the fertilization takes place, and so the fertilization in plant life is almost identical with that of animal life. We speak of the pollen as the male, but strictly speaking it is a spore. The great difficulty in breeding of any kind is that we have such an indeterminate number of characteristics that it is almost impossible to get a definite result, and while we can use Mendel's law as a guide, the whole problem of breeding will still be open to experimenters and to growers in general. It will explain some problems in breeding, but it will not do away with our old idea of breeding plants as it has been carried on. We have perhaps gained greater insight into breeding, but it will not supersede the old method.

Mr. Geo. J. Kellogg: What work has been done by your department in this line of breeding?

Professor Sandsten: We did something last summer in the line of plums, but we cannot tell the result for a number of years. We are going to keep it up along this line of work.

Now, in regard to heredity. If you will pardon me I will speak a little longer along that line. It has been our endeavor and the endeavor of scientists and investigators to trace out as nearly as possible the true principles of heredity, and why it is that characteristics are transmitted. Investigators have shown that in the fertilized cell after the mating of the two parents, there is a division in the substance of the cell into two groups of small bodies, visible only under a high power microscope, and those two sets of bodies correspond respectively to the male and female inheritance and they are supposed to be continuous through the generation and are transmitted to the offspring. These two bodies, so far as we know, form the physical basis of heredity. They are always present in the animal and the vegetable cell. They are carried over and transmitted, and those little bodies contain the physical basis of heredity or the type or form of species that we are working with.

Mr. A. D. Barnes: I know of gentlemen in New York who are advertising themselves as tree breeders. I know of those nurserymen propagating buds and scions procured from the parent trees in Wisconsin. Do you call that breeding?

Professor Sandsten: That is selection. Strictly speaking, it is not breeding.

Mr. Underwod (Minn.): How are you going to get our thousand dollar plum, by breeding or selection?

Professor Sandsten: Judging by our discussion of last night I should say it would have to be a cross-bred plum. I do not believe the native plum would reach the size of an inch and a quarter in diameter.

Mr. Underwood: Well, that is not arbitrary.

Professor Sandsten: Well, if it is a flexible limit you might get it from the native, but I do not believe the native plum will come up to that size. I believe it is possible to cross the native on the Japan and get that size. We have had native plums one and one-quarter inch in diameter, but it is an exception.

Mr. A. D. Barnes: How can you have a cross-bred plum of that size with a pit as small as the De Sota?

Professor Sandsten: It is possible. I believe everything is possible in the organic world if you keep at it long enough. I believe the possibilities in the development of fruits and animals are infinite. I don't believe there is a limit.

Mr. W. J. Moyle: I am surprised that Mr. Barnes does not know he has a seedless apple. We are getting close to the seedless plum. We have a paper shelled almond and we are working toward a seedless plum. Nothing is impossible in the organic world. If you believe in evolution the organic world has all kinds of possibilities before it. The development of a given individual must progress in the direction it has taken and there is no limit to that development.

Mr. Geo. J. Kellogg: The seedless apple is an accident.

Professor Sandsten: It is undoubtedly an accident. I don't believe the seedless apple was the result of continuous breeding, but simply an accident.

Professor C. L. Blair (Ill.): That is my understanding.

Professor Sandsten: I believe it is a spor just like the orange, but the man is entitled to credit for discovering the spor, but he is not entitled to the credit of having bred it.

Mr. A. D. Barnes: I want to sav to you that at Waupaca by the side of a piece of timber there is an apple tree that came up from seed. The larger specimens of the fruit have no seeds, but the smaller specimens contain seed, nnd I have seen the fruit grow this year and last year. The tree is not hardy and has been killed down several times. I am not propagating the tree, but would be glad to show it to you, and I think, perhaps, it would be worthy of propagation further south. The apple resembles what we call the Pewaukee, the flavor and texture being about the same. The larger specimens have no seeds, there is a sign of a core, but no seed and no cells.

Mr. Wm. Toole: There is another line of breeding we can introduce in our native fruits. We know that variations are not strong enough, and I think we can make an effort to break the natural tendency, and then after it goes back again to the native quality you can then obtain quicker results than if we had made use of their native hybridization.

Professor Sandsten: If we make the cross ourselves and break the type we will have a harder time to fix it, but in the case of the apple we can propagate by budding or grafting. In regard to Mr. Appletree Barnes' apple, that apple tree ought to make him famous, and if it is not carried away it will make Waupaca county famous.

Mr. Barnes: The gentleman who owns the tree promised to bring me some apples, but I am sorry to say he did not fulfill his promise. We are more generous at Waupaca than they are at some places, we don't want the whole earth. We shall be glad to give away some scions if anyone wants to propagate the tree. I don't believe it is hardy or I would have done it myself.

Professor Sandsten: I have a few more words to say in regard to the breeding of our native plums. The work at our experiment station has ben devoted to the improvement of our native plums almost entirely, and Professor Goff started that work fifteen years ago. The longer we have worked with them the more we have become impressed with one fact, and that is, that many of our native plums come true from seed. That is to say, if you plant the seed of a Wyant plum the seedlings are very uniformly Wyant.

Mr. Coe: Is that true of all the plums?

Professor Sandsten: I would not make any sweeping statement, but it is true to a great extent, and I doubt whether much improvement can be made in a short period of time except we go into crossing. I have no doubt that if we keep on long enough we shall greatly improve the native plum, but if we want to get quicker results I think we shall have to go into crossing. We have had a very promising variety of seedlings, but we have become disappointed in them from year to year. It will bear fine fruit for several years, but when it becomes older the fruit will shrink, and I almost think it will not be worth anything in a few years.

Mr. Barnes: Can you tell us why those larger apples have no seed and the smaller ones do? Is it because the energy of the tree goes into the growing and maturing of the seed instead of the pulp of the apple, and it makes one small and the other large?

Prof. Sandsten: I should say it probably was. That is merely an opinion, I would not pass judgment on it.

Mr. Geo. J. Kellogg: Those seedlings of the McMahan you had at the farm, were those accidental seedlings?

Mr. Cranefield: That goes back to what Prof. Sandsten has told you of the work at the Station. There are at the Station in the orchard five or six rows of seedling apple trees, averaging in all about a thousand trees. Those were grown from seeds planted by Prof. Goff, and the seeds were collected by him personally from the Hatches very largely. They were planted and the trees grown from those seeds. They are not only McMahan, but Golden Russett, Haas and many others. I don't know but that will answer your question.

Mr. Geo. J. Kellogg: I understood there were a row of 25 McMahan seedlings.

Mr. Cranefield: There are over one hundred McMahan seedlings. It is one of the most interesting studies I have ever seen. Mr. C. A. Hatch can give you a little more of the history of those trees.

Mr. C. A., Hatch: Those seedlings were selected partly from my farm and partly from the farm of A. L. Hatch. They were not indiscriminately selected, but they were carefully selected. I am now speaking of the McMahan seedlings. The surroundings of the tree from which they took the fruit were carefully considered. In my orchard he wanted to get some surrounded by the Orange Winter and he took seeds from those, and in my brother's orchard he took some that were surrounded by the Fameuse, and he went through the whole orchard that way, so the probabilities of pollenation lie in the combination of the two varieties. As I said, they were not selected indiscriminately, but they were carefully selected. My brother and Prof. Goff took nearly a whole day to select the apples they took the seed from, and he also took notice of the surroundings, for instance, whether the McMahan was growing near a Walbridge, a Fameuse, or any other variety.

Prof. Sandsten: We have given up a part of the work in breeding along this line because of the enormous number of seedlings we have to take care of for the possibility of getting one good seedling. It is impossible in planting trees side by side not to have a cross, because the pollen is flying all over, and there is just as much chance to affect it fifty or a hundred feet away as there is right close by. I believe plant breeding will be taken up sooner or later with strict attention paid to the protection of the seedling, because under the present system the chances of success are so remote that it ought to be discarded. We have experimented in that way with our plums. We have raised as many as 10,000 seedlings at one time. Now we have a bonfire every fall. When the hands get cold we set fire to an old plum tree pile and they warm themselves by the fire.

NATIVE MEDICINAL PLANTS.

Prof. R. H. Denniston.

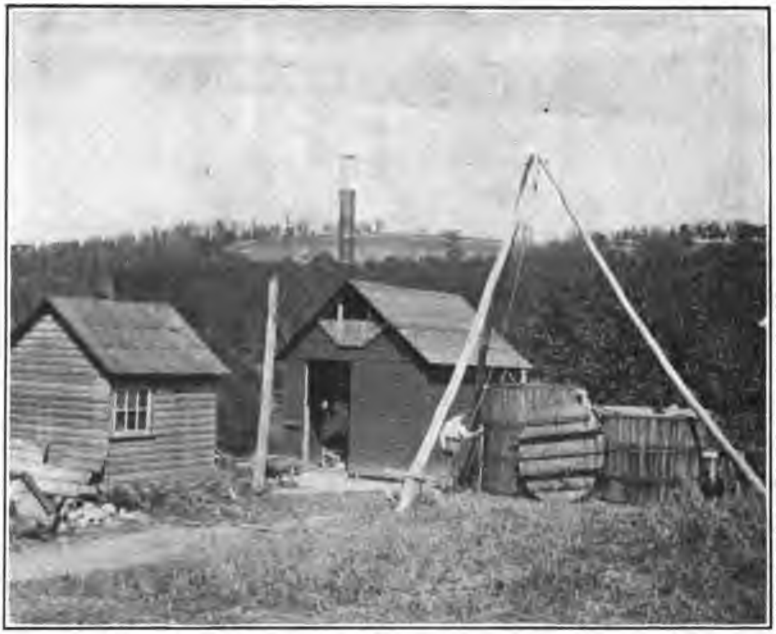
If I were to ask for a definition of native medicinal plants you would probably tell me they are our native plants which are used in the cure of disease. But if I were to describe all the plants which have been, or are still being used in medicine, I should be able to give you but little more than the bare list of names, in the time allotted me.

In early days in this country when apothecary shops and physicians were not as plentiful as they are at present, the people were their own doctors and their remedies were taken from nearly every tree, shrub and herb that grew in woodland or meadow. When the baby was sick, instead of giving him Castoria, catnip tea was the household remedy, and although I never heard that babies cried for it, probably as many of them grew to be healthy men and women as modern babies do.

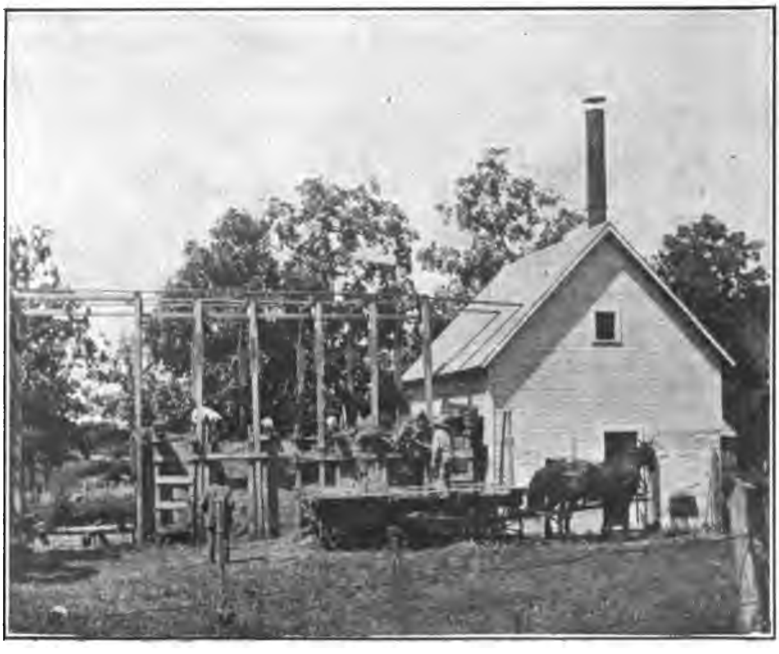
In nearly every garden there was a patch of chamomile and caraway, and every summer the prudent housewife laid in a stock of boneset, smartweed, elder berry juice, skunk cabbage and wild turnip, against the ills of winter. Certain wild medicinal plants were collected and sold in the market. The demand for these plants has increased with the growing population and in many parts of the country they have now been practically exterminated. Millions of pounds of wild growing drugs are now collected every year.

Ginseng was formerly fairly abundant in our woods not far from Madison, but now one might tramp all day without finding a single plant. Ladies' slipper and Seneca snake root are fast disappearing and if they are not cultivated it will be but a short time till they are no longer to be found in the market.

The drug collector is not the only destroying agent however, as has been pointed out by Dr. True of the Department of Agriculture. Other causes which lead to the destruction of wild plants are the cutting of the forests and the use of forest land for the pasturing of stock.



STILLS AND ENGINE HOUSE, FARM OF H. HOGGARD, NEAR OKEE, WIS.



TILLING THE STILL, L. S. DREW FARM.

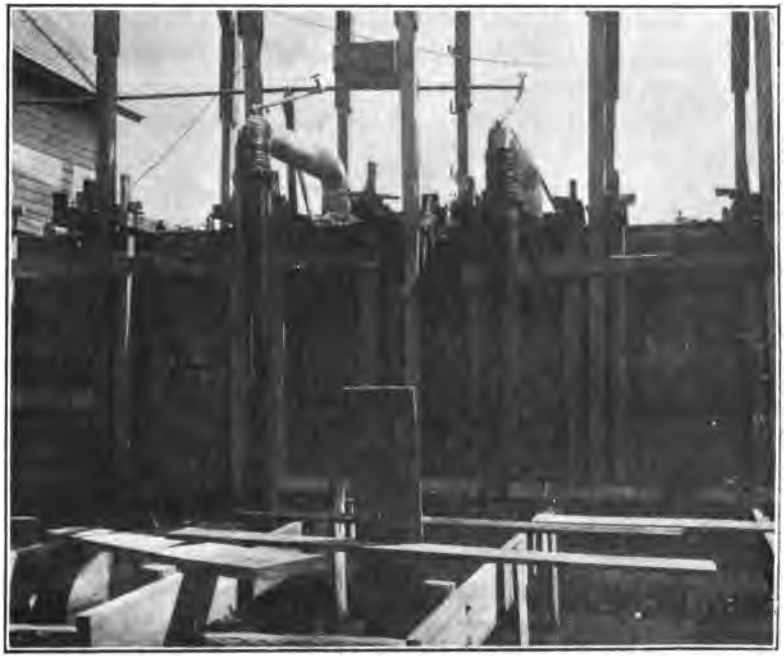
Although the price of drugs has gone up with their increasing scarcity, there are few places in our state at present where a collector of native wild plants could make a good living. It is true that there are many drug collectors in Wisconsin at present, but most of them have other occupations, and collect drugs only at certain seasons.

The question as to whether medicinal plants can be *raised* in Wisconsin can be answered at once in the affirmative. They *do* grow all about us, in our gardens, fields and woods. So plentiful are they that we have passed laws against some of them as noxious weeds; among the latter are the burdock, yellow dock, dandelion and mustard, and the curious fact about it is, that we import annually thousands of pounds of drugs from these same weed plants.

You will ask why we do not use more of our own plants instead of importing them, the reason is that we are too prosperous and the cost of labor is too high. We can hardly raise these drugs at a profit and at present find it cheaper to import them. But the government has endeavored to point out to the farmer that, in ridding his farm of weeds, he may be able to make the pests a source of small income. In order to help the farmer to obtain the best prices for such products a bulletin has been issued giving instructions for the collection and preparation of crude drugs derived from weeds. (Farmers' Bulletin No. 188.)

These drugs consist of various plant parts, leaves, flowers, fruits and seeds which are used in medicine. Among the common weeds described are burdock, yellow dock, dandelion, couch grass, mullein, lobelia, tansy, boneset, catnip, yarrow, Canada fleabane, black and white mustard. The prices paid for these weed drugs are not high; burdock root brings from 3 to 8 cents a pound; dandelion root from 4 to 6 cents; couch grass, 3 to 7; mullein leaves, 2½ to 5 cents; lobelia tops from 3 to 8 cents; tansy tops, 3 to 6 cents, etc.

It is possible that the cultivation of these drugs in large quantities would prove profitable. Large quantities are consumed annually in this country and the supply now comes largely from abroad.



BACK OF STILL SHOWING COOLING CISTERN IN FOREGROUND AND CONDENSING PIPES, L. S. DREW FARM.

HARVESTING WORMWOOD NEAR LODI WIS FARM OF L S DREW.

We imported during the year ended June 30th, 1902, over 5,302,500 pounds of mustard seed having a value of $265,000. We import about 30,000 pounds of tansy every year. The mullein plant is cultivated in Germany and we import from there about 5,000 lbs. of the flowers annually at a price ranging from 25 to 75 cents a pound. We import about 250,000 pounds of couch grass every year. This is one of the worst pests of the farmer in certain parts of the country.

The cultivation of medicinal plants in Wisconsin is not a new thing. A few miles from Edgerton, W. A. Clark has been raising sage for the past twelve years. He has from 5 to 12 acres planted to sage and says it is not difficult to cultivate, after the first year. A good yield is about 1,500 pounds per acre, and the price paid is from 5 to 12 cents. The herb is cut and spread on racks to dry which requires about 3 weeks. Then on a moist day it is packed in bags for market. If the stubs are trimmed in the spring, one planting is good for eight years.

Near Lodi there are two farmers who raise annually from 40 to 60 acres of wormwood apiece. Both of them have stills and extract the oil. The yield is usually from 7 to 10 pounds of oil per acre and the price ranges from $4 to $7 a pound.

Ginseng is raised in various parts of the state. The government has issued a bulletin on its cultivation. (Bulletin No. 16, Div. of Bot.) and it is not difficult to grow if instructions are followed closely. It is a plant of the woods, hence an artificial protection from the sun is necessary, and the soil must be as near like the rich mold of the woods as possible. An artificial shade is constructed by nailing lath to a frame about an inch apart and raising the same about 8 feet from the ground. A farmer near Baraboo has four beds of ginseng, each 6 ft. wide and 7 rods long. After planting the seed, it requires from 4 to 7 years to produce the first crop of marketable roots. The ginseng seed must never be allowed to become dry. After they are sown it takes about 18 months for them to germinate. When the plants are two or three years old they may be transplanted and set 4 to 6 inches apart. Ginseng is now worth from $4 to $8 a pound according to quality.

On a farm near Milwaukee, German chamomile grows wild.

It comes up around the edges of the field, between the grain and the fence. The farmer on whose farm it grows thinks that if cultivated, 500 to 600 pounds per acre could be raised. It brings 20 cents a pound in the market.

A number of drug plants which were formerly collected wild in Wisconsin, have now become practically exterminated in all parts of the country. The demand for them has increased rather than diminished and the price has gone up accordingly. On this account the Department of Agriculture has undertaken to find out the way in which they may be cultivated. Golden seal and Seneca snake root are two such plants. A bulletin has just been issued on golden seal. Experiments on its cultivation have been in progress since 1899. Much the same treatment is necessary as for ginseng. As yet it has not been successfully raised from the seed, but is propagated by division of the rhizome, and by means of small plants formed on the stronger fibrous roots. The roots may be gathered at the end of two or three years, and for propagation alone, one year will give good results. The yield of the first crop raised by the government is estimated at about 1,500 pounds of dried roots per acre. The price is sensitive to market conditions, and in 1904 varied from $.74 to $1.50 a pound. The annual consumption of golden seal in all countries is estimated at from 200,000 to 300,000 pounds.

To sum up, it is seen that we have all about us plants which have been used in the cure of disease, few of these are used at present. They have been replaced in many cases by synthetic chemical preparations. Of these common native plants some have a market value which, however, is so low that it does not pay to collect and prepare them.

Other native plants which are still in considerable demand have been practically exterminated. The limited cultivation of these if wisely carried on should prove remunerative. Besides these two classes of *native* medicinal plants, there are those of foreign origin, of which large quantities are now imported and used in this country. The government has shown that licorice can be grown in this country. We imported over 109,000,000 pounds of licorice products in 1902 at a cost of nearly $2,000-

000. Other plants which have been successfully cultivated by the government are capsicum, belladonna, henbane, stramonium, caraway, anise and coriander. Certain of these will grow in Wisconsin, and only an experiment will show whether or not they may be raised profitably.

DISCUSSION.

The President: This is a very interesting subject to me, and it ought to be interesting to a good many others, but perhaps some of these things are not so widely known.

Mr. W. J. Moyle: Give us a little more information about belladonna. What kind of a plant is it and what is it used for?

Prof. Denniston: Belladonna is used largely in this country. The bulk of it is raised in New Jersey where there is a twelve acre farm. The price of belladonna is good, I think it is about twenty cents a pound. Whether or not belladonna can be raised in Wisconsin I do not know. Certainly it would have to be started under glass and the seedlings transplanted.

Mr. Moyle: To what order does it belong?

Prof. Denniston: Solanacae.

Mr. Moyle: One gentleman spoke of ginseng. J. C. Vaughan states that the cultivated variety could not be sold. I would like to know whether the professor knows anything about that.

Prof. Denniston: There is a demand for ginseng or people would not grow it. There are five hundred growers in New York state, and the market reports show that ginseng brings a good price.

Mr. Cranefield: I beg of you don't go into ginseng today. I want to promise you this, next winter or summer we will take up the subject of ginseng and allow you to thresh it out.

The President: I think we shall have to close this discussion unless someone wishes especially to be heard.

PANSY FIELD OF WILLIAM TOOLE, BARABOO, WIS., SEPTEMBER, 1905.

COLD STORAGE OF FRUITS.

Prof. J. C. Blair, University of Illinois.

(Stenographic Report.)

Mr. President, Ladies and Gentlemen: The cold storage of fruit and like commodities is of interest to four or five classes of people. In the first place, this problem is of interest to the warehouseman, the man who goes into the cold storage business as a commercial undertaking. It is also of special interest to the producer of perishable commodities, such as fruit; and, in the third place, to the general farmer, the man who is trying to bring the productivity of the soil to the highest point, and who is trying to extend the selling period of his products. It is of interest also to a fourth class of people, and that class is the rest of mankind, the people who are anxious to buy these things after they have been produced. I might include a fifth class, that is the manufacturer of insulating material, but I will leave that class out of consideration.

Talking to this Society three years ago this month, I discussed the cold storage problem somewhat in detail from the standpoint of the second class of people; that is the fruit grower; the man who is producing on a commercial scale a perishable commodity, and who is endeavoring to obtain the largest return per acre. Those of you who were here at that time, will recollect the fact that the Department of Horticulture of the University of Illinois had undertaken to demonstrate in a practical way just what can be done by such a fruit grower. I called your attention to several models, and I have here before you a reproduction of a cold storage house which was built for the express purpose of throwing light upon that phase of the cold storage situation. With state funds we built at Neoga a cold storage house, situated upon two lines of railroad, the Illinois Central and the Clover Leaf; a structure 40 feet wide and 81 feet long, having three distinct compartments. This first compartment is the receiving room. This second room is a receptacle for the fruit, the refrigerator proper; a room 40x40 with 14 foot posts, giving a storage capacity of about 2,600 barrels of apples. In the same building, only in an adjoining room, is the ice storage compartment, a room 28x40, with a storage capacity for natural ice of 400 tons, which allows for sufficient ice being stored in the building from which to provide the refrigerator during twelve months of the year. The ice is to be taken, when natural ice is used, direct from this room to the refrigerator proper.

I am not going to spend a great deal of time on this particular structure, but something was said touching the subject by some of your members. What we are trying to do with this structure in following out this line of experiment was to answer these questions: Can a commercial grower of apples in the apple regions of our fruit producing states afford to construct a storage house, depending upon natural ice for cooling the same? What are the advantages of such a house? The advantages of such a house located near an orchard or near the railroad station may be briefly stated as follows: The fruit could be barreled and go from the tree immediately to storage and be cooled to such a degree as would arrest the ripening process of the fruit. The fruit could be stored in temporary packages and the packing or barreling could thus be deferred until the picking season was over. In the event of a scarcity of barrels the fruit could be put in in bulk and packed later when barrels could be obtained. Incidentally the fruit could be better handled and the producer could pick the fruit at just the proper time. The question then arises whether the advantages would justify the outlay under the proposed method of storing fruit. There we have then the whole cold storage problem surrounded, at least so far as it applies to this second class of people referred to. The state then undertook to settle the problem by building and actually conducting a cold storage house for the orchard. I told you three years we had started the problem, now what are the results? I will tell you that later.

Let me call your attention to the other charts which you did not see when here before, and which will give you a better idea of the structure. A cross section of the building shows a place where 20x40 and six foot ceiling. This is the refrigerator box and it is directly over the fruit storage room and has 100 tons capacity. This shows you somewhat the character of the structure. Note that the several walls differ in construction. Turning our attention again to the details we see that 2x4 studding, 14 feet high and 18 inches on center are faced on the outside by a double thickness of "Diamond A Red Rosin Sized" paper, and then comes a sheathing of 7/8-inch hemlock flooring. On this sheathing are again placed 7/8-inch strips vertically shown in the details. Upon these strips is nailed the dropped siding of hemlock. Note, however, that this exterior wall, furnishes a free air space which continues from the sills to the eaves, thence to the ridge-pole where the air escapes. The hot sun beating on the roof or sides of the building causes the air in this outside air space to rise and escape at the ventilators, as shown in the cross-section of the ridge-pole. On the 2x4's from the inside is tacked a double thickness of building paper, the same paper being used in each case, and to this also have been spiked the 2x2's. Then comes another double thickness of paper, then a sheathing of 7/8-inch lumber, and again 7/8-inch strips, then another double thickness of paper, then a sheathing of 7/8-inch lumber. As seen in the cross-section of the walls and roof, this construction extends throughout the walls and roofing to the top of the refrigerator. It should be noted, however, that this applies only to the walls and roofing of the fruit storage room, and varies to a certain extent in the other portions of the building, as seen in the details. It should be further noted, however, that the insulation of the walls extending to the roof on either side of the fruit storage room has been increased beyond that shown in the details. In other words, there should appear another layer of 7/8-inch strips, and consequent air spaces, then another double thickness of paper, and then a sheathing of 7/8-inch lumber. This gives a total of four dead air spaces, and an outer free air space, five double thicknesses of paper, and five thicknesses of sheathing, including the weather boarding. The vertical air spaces occasioned by the 2x4's, 2x2's, and 7/8-inch strips have been broken up at intervals of every five feet, thus insuring greater efficiency from the air spaces themselves. In other words, the smaller the dead air spaces, the less liability there is for imperfections in the insulation.

Looking at the ice storage room we find the walls differing from those above in having one less thickness of sheathing and building paper and one less dead air space, the outside construction remaining the same. The east wall shows the came construction, excepting a free outer air space and one thickness of sheathing are omitted. The wall between the ice storage room and the fruit storage room, and also between the fruit storage room and the cooling room, we find an entirely different construction from that seen in the former details. 2x4's, the same distance apart, have a double thickness of building paper on either side and a sheathing of 7/8-inch lumber on these. The side next the fruit storage is then faced with 7/8-inch strips 18 inches on center; upon this is another double thickness of paper, and then one additional sheathing.

The refrigerator, or ice-box proper, is 20 by 40 feet. A cross-section of this refrigerator is here shown. This box is supported by ten wooden posts 10 by 10 inches, 14 feet long. Lying on these posts crosswise are 3x14-inch joists, 12 inches on center. These joists are protected from the drip-water by galvanized iron caps. The water falling on these is caught by the galvanized iron troughs suspended between the oak joists and from thence it drains into galvanized iron gutters running east and west. From the gutters the water is drained through down-spouts into vitrified tile drains. Upon the caps proper, over-lying the oak joists, are 2x2-in. oak pieces, 2 inches apart, as seen in the details of the floor of the refrigerator. The ice rests directly upon the 2x2 oak pieces and is so piled as to allow the cold air to flow directly away between the oak strips and the joists into the fruit room below. By means of the false ceiling, as shown in the upper part, the air is deflected to the outer walls, and thence follows the ceiling back into the upper part of the refrigerator. The walls of the refrigerator, which are 6 feet high, are boarded with matched flooring to within two feet of the top, thus admitting the warm air following up from the ceiling and walls. Above the refrigerator we find

2x6's, 18 inches on center, covered above with double thickness of paper and then a layer of fence flooring. On the under side of the 2x6's we find another layer of double thickness of paper, then sheathing, then a ⅞-inch dead air space, then paper, then another sheathing. Through this ceiling, are three trap doors for ventilation. When the one door and the ventilators are opened, perfect ventilation is secured. The capacity of this refrigerator is 108 tons of ice.

Space will not permit us to give in detail the construction of all the various parts of the building. We must leave the interested reader to make this out for himself from the plates and diagrams. The entire matter, however, is to be issued later in bulletin form. In closing the brief account of the details of this structure we wish to emphasize the necessity of having the dead air spaces perfect *dead air spaces*. The workmen must be carefully watched to see that all joints are close fitting and that the paper is never broken.

COST OF STRUCTURE AND FIRST ICING.

Lumber	$1,516.74
Foundation, etc.	194.73
Paper	113.10
Hardware	241.13
Painting	62.75
Labor	777.99
Miscellaneous	40.00
Traveling Expenses and Drawings	133.62
Total Cost of Construction	$3,080.41
First Icing—80 tons at $2.30 per ton	184.00
Total Cost to Date	$3,264.41

Leaving out of consideration the cost of the ice and figuring storage charges on the basis of what would have to be paid a cold storage warehouse for the holding of this fruit now in storage, 2,000 barrels, we have a return of 33⅓ per cent. on the original investment made. It would require three years to pay for the building at this rate, with a relatively small amount to be figured on each year for ice. One hundred tons of ice seems ample to give the desired temperature (thirty-three to thirty-five degrees) throughout the entire storage season, and if natural ice can be harvested it need not cost over $1.00 or $1.25 per ton.

The cost for the construction of a building of this character must always vary for different localities, depending upon nearness to railways, character of labor, etc. Our building at Neoga was built as cheaply as possible, taking into consideration the perfectness of the insulation.

It was our effort to put up a building as cheaply as possible. That is, we tried to find the cheapest material considering its insulating efficiency. It is a well known fact from experiments conducted in one place and another, and from the standpoint of scientists, that confined air is one of the best insulators we have. Paper is also one of the best insulating materials we have, and wood is an excellent insulating material. In order to demonstrate what this means, let me call your attention to the fact that copper is one of the best conductors of heat we have. In other words, the thermal conductivity of copper is 910.000, iron 160.000. What about brick, stone, sand, etc? Brick or sand or any form of clay has a thermal conductivity of about 2000 to 10000. What about wood? It depends entirely upon the character of the wood. It depends whether the heat is transmitted crosswise of the grain or lengthwise; the difference being about 50 per cent greater if it goes lengthwise of the grain. Well seasoned oak has a thermal conductivity of about 500, with copper at 910000 and iron at 160.000. Now, what about paper? Paper, the ordinary writing paper as we find it in commerce, has a thermal conductivity of 94, and to come right down to the dead air space, the confined air, we have a thermal conductivity of 49. You see the relative proportions. The point is this, that free air is one of the best mediums for conveying heat while, if we can hold it still, it is one of the best insulating materials we have. Using the sized paper so as to prevent the passage of air from one space to another, we are able to build up a series of air spaces which are of themselves much better than paper and are better than wood. The chief advantage of the wood is to form a backing for the paper and to insure the stability of the structure.

What takes place when the sun strikes a wall of this character? This layer of air is heated, and as it heats it expands causing a rising in this column of air, and you see in this air space here (indicating) cold air can come in. There is a continual current through this space here (indicating) and throughout the outer air space to the ridge-pole. The heat striking this wall here causes a warming of the air in this column here (indicating) and that means that as soon as this inner outer layer begins to heat it rises, and for a short time the entire air in that space is of a uniform temperature. When it comes here (indicating) there is a little loss of ice as a result of the heat passing through. That is the thing we were trying to determine in building such a structure, to select something which would be thoroughly efficient and yet be cheap to the fruit grower.

Now, then, what was accomplished? The first year we operated this building with ice beginning on the 5th of October. We had in the building then two thousand and a few odd barrels of apples. We put in 70 tons of ice, and between October 5 and April 23 there was consumed about 60 tons of ice. The actual results from this first year's operation of this plant can be carefully stated. The total cost was $3,430.40, interest on building at 6% $205.82, cost of ice, 60 tons——and I should say that in this first year's test we used artificial ice rather than natural ice, because the building was only completed in September and we could not take advantage of the natural ice. Now the ice, the 60 tons cost $2.30 a ton, or $138 total, the cost of each barrel of fruit stored would be a fraction over 10 cents. The total cost per barrel to ice would be about .69 cent per barrel, and the total expense per barrel would be 19 cents, the total saving over the regular storage charges would be a fraction less than 31 cents. The net saving on 2,600 barrels would be $618. The total time required to pay back the interest and the principal on this structure would be five and one-half years. If you take the full capacity of this structure and assume that it will require 75 tons of ice instead of 60 to carry the building through, what can we say? Figuring it out one year with another, as I have done it here, we find the savings in five years will pay the cost of the building. That is, it will pay the original cost which was $3,430.40, then add the saving in the icing and operation of the building for five years, it would return a surplus of $128. This is figuring it entirely on the basis of what was accomplished the first year. The second year we used natural ice. The ice which was stored in the building had to be hauled a considerable distance, cost us about one dollar per ton more, and then it had be to stored in the room over the refrigerator. The figures the next year did not materially change, but the third year we found we might have saved considerably in the cost of the structure by doing away with that ice storage room. The cost of natural ice in the summer time was considerably more than that of artificial ice. Artificial ice at $2.30 a ton is not expensive, and at times we got it much cheaper, and artificial ice seems to do better work than natural ice.

Now, what about the temperature? During the entire three years we have had a recording thermometer in the building and have kept a record of the temperature. The record showed that the temperature was kept at 32 degrees ranging to 33 degrees, except for a few days in the spring time. The record of the temperature shows that the insulation is as perfect as we might wish in view of the insulating material which was used. The greatest outside fluctuations and variations in temperature occurred in September two years ago and again late in April when not much fruit was in storage in the building, but there was no appreciable effect upon the inside temperature.

It simply means this, so far as the commercial fruit grower in Illinois is concerned, he can afford to build a structure upon his plantation, or he can put it at the nearest railway station in his locality and store fruit for himself and his neighbors and make the investment pay. It depends upon the man who is operating it and still more upon the workman who is building the structure. It is not advisable to let such a structure be built by contract. I would not think of it. Only the man who has the matter at heart should look after the insulation. We found in the building of this structure that the so-called skilled carpenters were the ones we did not want. After start-work the men who were drawing $2.50 to $3.00 per day were the poorest we could find, because they were in the habit of building dwelling houses and would not look after the details necessary; they would even drive their hammers through the paper and so on, and that would not do. We took unskilled abor at $1.25 to $1.50 a day and put up the structure under the direction of a very thorough and honest man.

Another thing I want to call your attention to,—we found we could have saved a good deal in the cost of the construction of the building if we had put all the studding on the inside and started the insulating against the studding and worked toward the outside. We worked from the outside in, instead of from the inside out. In that way they were working more in the dark, and you want to get all the light on your work you can. We have plans made based upon the experience gained during the three years to show the improvements that can be made along this line. So much, then, for the question from that standpoint.

Now we will consider the matter from the standpoint of the smaller grower of fruits or the standpoint of the general farmer. Is it possible, for those of you in certain sections of this state who have only a few acres of orchard and are interested in other things, to build a structure that will be efficient and have it within your reach? I think it is, and in the light of the thought which we have given this matter and in our own experiments and with the experiments conducted elsewhere, and taking account of the scientific knowledge of insulation, we have made another set of plans which I will present to you for what they are worth. Here is a house which is designed for the small grower of fruits and the general farmer, a house 17x30 with 10 foot posts. Here is a cross-section of the house, (indicating on chart) the ice going in here, (indicating) at this door; the entrance to the building being at this point, (indicating) and here is our receiving room (indicating) with one entrance here and another here (indicating). The cross-section of this building lengthwise is seen in this diagram here (indicating). This is the ice box (indicating) and this is the cold room (indicating) with a temperature of 33 degrees. Then here is a large general storage room with a temperature of 38 degrees. There is another room I will show you on the next chart intended for a milk room with a temperature of 40 to 50 degrees. This (indicating) is the door I showed you in the first chart. The ice goes in here (indicating) and through this opening here (indicating) there is a door directly to the ice box. This refrigerator has an ice capacity of 16 tons. The next chart will tell us more. This is the ground plan of the structure, this is the ice box having a capacity of about 16 tons, with a cold room temperature of about 33 degrees and 8x10 in size. Here is a cold storage room for general purposes 11x16, with an entrance 4–6x7, and with a milk room 4–6x9–6. There is no connection between this milk room and the rest of the storage house, excepting as we go into this storage room here (indicating) through the door, and the door is absolutely tight. We have in this room an arrangement to take the drip from this refrigerator at this point (indicating) to take the melting ice water and bring it into a tube which runs into a series of coils in a certain place in the milk room. There can be no contamination whatever. If it were used for storing anything whatever, vegetables or anything of that sort, there would be no contamination of the milk by using the ice water. This shows the door leading from the entrance in the milk room. Note that along this side (indicating) there is a large open space, and this is left upon so air can circulate through this room and back again, as you saw it in the other chart, and keep up a continual circulation. This temperature is about 38 degrees, or you can have anything you like by shutting off the flow of cold air from the ice box. Such a structure, figuring very carefully on the basis of the present cost of material, can be built for $850 to $900. You see it may be a little above what we would like. So I will show you a little cold storage house which in some respects is better and the cost is a little smaller. Every time you increase or decrease the size of the structure you increase or decrease the cost of the structure.

Now this (indicating on chart) is one built on the same plan, and I want to give you somewhat in detail all the different items of expense that come in. The reason I am doing so is this: In talking with members of your Society two or three years ago it was impressed upon my mind that the chief difficulty with the Wisconsin fruit grower is that he is growing, for the most part, fall and summer apples; Fameuse, McMahan, etc. His fruit is ready to market when southern apples, that is, Illinois and Missouri apples are coming into market. Professor Cranefield told me that he saw, a year ago, some two thousand bushels of McMahan apples practically sacrificed because the market was glutted at that time. It seems to me the solution of the whole question could be brought about by building upon the farm a storage house to be used for fruit and general farm purposes. In other words, extend the selling period of the commodity you are producing on the farm, let it be what it may. Nearly all of you are interested in something besides fruit, and such a structure would be available for many purposes. It is of special use to people in northern and central Illinois.

Now, this (indicating) is the last chart to which I want to call your attention. Here we have a structure 14x24. We have a large work room, a sort of entrance room to the storage room. On the farm in a storage house of this character a great deal of work needs to be done, such as handling milk and fruits, at the same time our temperature is too low and we do not want to sacrifice too much ice, because when a person goes in with a warm body considerable ice is melted, so we have increased the size of the receiving room of this structure. We have here (indicating) a room 4′ 6″x14′ 6″, having good light and a passage way through this cold room for general purposes. This is a room which may be used for the storage of milk or for other purposes, as was the other room shown in the preceding illustration which we called the milk room. Then in this corner (indicating) we have a 5x8 meat room. It would be a great convenience if we could have some place in our storage house where meat could be kept for a little longer period than is possible under the present arrangement. We have put the meat room off here by itself. The ice box is 7′ 6″x7′ $6''_2$ with a capacity of 8½ tons of ice. The cold room is 6′ 8″x8′. A cross-section of this structure is shown here (indicating). We have started the outer layer directly upon the 2x4. This shows the 2x4 material spiked together, with a double thickness of paper here (indicating) and there is no free circulation in the outer cover. This (indicating) is sheathing, or whatever it may be, then an air space, then paper, then an air space. All air spaces are put in about two feet square, so you find a 2x4 here (indicating) and an opening 4x4 in this space. That is, we have sheathing, paper, air space, again sheathing, an air space and then an inner sheathing. Always have the inside of the building a smooth sheathed surface and coated with paint to prevent the absorption of moisture. Perhaps this would not suit most people, but it is not expensive; simply a layer of flooring here, nailed on the 2x4, then red rosin sized paper, then sheathing, then some more paper, then a 7/8-inch strip and then another layer of flooring. If we should continue farther we would put in another layer of concrete. But I would leave out a part of it and sacrifice a layer of material, because we have found that cinders are not as good an insulating material as they are claimed to be. Concrete is a good conductor of heat and a poor insulating material. A cross-section of the house is seen here (indicating). This is the receiving room (indicating) and this is the ice room, (indicating) and the other rooms I referred to are here. The ice is taken in at that end of the building. A modification of the wall structure could be made the same as I have it here. Simply a layer of matched boarding placed directly on the 2x4, or even smaller strips than these 1½ inch, then a layer of paper and on the other side flooring on the strips, then a layer of paper, which makes a double air space, then a double thickness of paper and then filling in the air space with shavings from the planer. They are better insulating materials than sawdust. Or, if you choose to go to the expense, put in mineral wool or something of that nature. Whether you take mineral wool or planer shavings, the idea is to hold the air in definite spaces dependent upon the character of the shavings or the sawdust or whatever may be used in this confined space. In other words, the mineral wool, sawdust or shavings gives a multitude of air spaces which are the best kind of insulating material. The clothing we have on is of value chiefly from the fact that within the cloth is held confined air, and because of that fact, since heat is really a form of motion, it is interrupted in its motion by coming in contact with the numerous fibers in the clothing, so that in the lining of our coat and other clothing we have on our body we are furnished with the very best insulating material, for the simple reason that we have there an innumerable number of small air spaces, together with the other fact that the fibers running crosswise prevent the passage of the heat, which is one form of motion, as I have said. So mineral wool or sawdust or shavings from the planer are of value simply because they break up the big air spaces into smaller spaces.

I will not weary you with details. This shows the formation of the doors and window sills, and so on. Now, of the various kinds of insulating we have used in these structures by practical tests, what are the best? Let me give you the results of 22 we have used up to the present time. Here we have simply two layers of matched lumber on that side. This forms an air space in which a number of insulating materials are used on the inside. A wall of this character has four layers of board and four layers of double thicknesses of paper and ten inches of mineral wool and has a thermal-efficiency of about 100 per cent. Eight inches of mineral wool laid in there would give us an efficiency of 97 per cent. Planer shavings instead of mineral wool have an efficiency of 88 per cent, or 12 per cent less than mineral wool, while sawdust has an efficiency of 70 per cent, or 30 per cent less than mineral wool. Again, take lino-felt, a new material offered by manufacturers, and put in a layer of this, which is another form of mineral wool, and it has an efficiency of only 49 per cent. I will not bother you with all these figures, but will simply say when you come down to ten inches of cinders in this space (indicating) instead of mineral wool you have an efficiency of only 34 per cent. Let us take one of these combinations we have here on the chart. We will take this one (indicating). Here (indicating) we have a dead air space two inches, and if we put in lino-felt we have an efficiency of 59 per cent; in other word, the air has given us 10 per cent or over in this form more than in this form here (indicating). This duplication is something of special interest to you who are interested in this structure. They are set out here so they cannot be misrepresented. They are arranged in the order of their efficiency so that they can be easily understood. I should have said that all these air spaces are practically two foot air spaces in this cross-section.

Let me refer to some important results. It seems to me of all the classes of people interested in the cold storage of fruit and other commodities, there is no class more deeply interested, or which ought to be more deeply interested, than the smaller grower of fruits or the general farmer. In the first place, the question, engaged our attention because repeated experience, has taught us that the farmer's small surplus of perishable products must often be given away. The present conditions are such that when the farmer has a supply of fruit or vegetables to market a nearby farmer has a supply to market at that same time, and as a consequence the price is so low that the returns are not sufficient to pay the cartage. So much for the subject from the farmer's standpoint.

Now, what particular degree of temperature should be maintained for various kinds of fruit? This is a point much discussed in horticultural meetings and for which we have no positive answer. It seems from our experiments running over three years with a temperature of 31, 33, 35 and 37 degrees, the lowest temperature was the best. In connection with a low degree of temperature we should have as much humidity as possible. These ice storage houses with a temperature of 33 degrees, with the air practically saturated with moisture, prevents shrinkage, and there is less loss than in our mechanically refrigerated houses.

What time should fruit be taken from the tree and placed in the house? That is another question we might spend considerable time in discussing. It has been the practice to pick fruit before ripe, and we are told now to wait until it is dead ripe. I think one practice is as bad as the other. I think the best time is to pick the fruit when coming to maturity, and take the fruit not all at one time, but select that fruit which matures first and all the fruit which matures at the same time.

I think I will not stop to give you any more of the details of this subject, but will leave the question with you, and if you have any questions to ask, that I can answer, I shall be glad to do so; or if you have any suggestions to make I shall be glad to hear them.

DISCUSSION.

The President: I would like to ask you one question. I have the general idea of this, but when we come to build how are we going to get specific instructions, unless we could get your blue prints or something like that.

Professor Blair: I hope that within the next twelve months all this will be in bulletin form, and you are as welcome to our publications as the people of our own state. Write to the Secretary of your Society or to the director of our Experiment Station or to me and I will see that you get the publication. I have here a bulletin which shows the building, the details and the working plans of the Neoga building. In making experiments of this nature there is a tendency to announce results too soon. There is a temptation to say we have the greatest thing on earth. We felt it was best to wait a little while and let the thing go through a number of years, because, after all, one of the foremost factors in this storage house subject is the question of the longevity of the building. What is the life of a structure of this kind? Will that paper remain intact for seven or eight years? All we can say up to the present time is that it has stood the test absolutely.

Mr. A. J. Philips: What was the capacity in barrels of apples of the last two buildings you showed?

Professor Blair: I did not figure it out, but I should judge that 17x30 building would hold a little over three hundred barrels.

Mr. Thurber: You did not state the cost of that building.

Professor Blair: $650 will build it anyway. If you build it yourself out of some material you may have on your farm it will cost you less; it will not cost you a great deal of money. Let me tell you what that building would cost for lumber. You figure that this last building would take 2,660 brick at $11.50 per thousand, then you use $31 worth of cinders, but you would have an offset of $16 if you take away the cinders entirely. Concrete, you see, would increase the cost about $30. Sewer pipe and tiling would cost $3 or $4, and galvanized compartments and fittings for the ice box would cost $250; tin work would cost $15. Painting the building would cost from $40 to $45. The hardware for this building would cost $22 and the insulating paper would cost $35. The lumber, 2,688 feet at $20 a thousand, would cost $53.72. The materials and incidentals would cost about $29.70, making the cost for material $300.-50; labor, which is not included in the cost of the building, would be $150, making the total cost of material $500, and the total cost of labor, $150, making the total cost of the building, $650. It can be built anywhere for that money at contract price.

Mr. J. T. Edwards: Did you ever have any experience with a cement building, either constructing a cold storage house or a packing cellar of any kind?

Professor Blair: We built a cellar at Champaign, the store room was about two and one-half feet below ground, a heavy stone wall on one side and a brick wall on the other, and we undertook to insulate the floor with cinders, cement alone would not do it. Cement is as good a conductor of heat as sand or brick, and there is a steady stream of heat coming in through this concrete in the building, and that structure which cost us in the neighborhood of $380 was a failure, simply because we could not keep the heat out. First, we insulated the brick wall by putting up studding and putting on paper and filling with shavings. This wall was all right, but the floor was a failure. When we had our building finished so it was a storage room we found we had spent more money below ground than we had above ground.

Mr. Thurber: What did you put under your cement floor?

Professor Blair: Ordinary earth and cinders.

Mr. Thurber: Will ordinary earth do?

Professor Blair: Yes, sir. But it is always best to make a good foundation of broken stone and cinders.

Mr. Thurber: You said cinders were not a good insulating material.

Professor Blair: That is what I said and that is what I mean.

Mr. Thurber: Is there anything you could put under a cement floor to insulate it?

Professor Blair: That will be treated in one of our publications. I want to show you the idea on that chart (indicating). In building our floor we want concrete for our last finish so it can be washed and taken care of. Imbeded right in with the cinders on top of the earth 2x4, or 4x4, or whatever you may use, to prevent decay, and then put down a layer of paper to prevent the moisture from coming up and penetrating the first layer of flooring. Put on your flooring and then put on 7/8-inch strips, making an air space, and then put on another layer of paper and then your flooring, then the cinders on top and then your concrete.

Mr. Irving Smith: Will not such a floor settle down in a few years and the cement crack?

Professor Blair: It may in time, but I do not think so.

Mr. W. A. Toole: I think you stated that the construction of your next building would be modified in several instances. What would be the difference in the price, and if we cannot wait for the plans of the next building, would they be pretty nearly the same?

Professor Blair: I think so, with perhaps a few exceptions. I would suggest putting the frame work entirely on the inside. Frame the building with 2x4's spiked together, making it 4x4 for a heavy building, because the wall after it is once put up is thoroughly rigid and will hold the studding until you get it in such shape that there is no chance to move. Commence on the inside and work out. Carry the idea with you all the time that you must protect the insulating material at all times from the weather. If the water gets at this insulating material you will soon have no insulating material at all. You want to keep your lumber dry, keep your paper dry, and keep everything during construction dry. If you use mineral wool keep that dry.

Mr. Irving Smith: Have you ever had any experience with what is commonly known as a root house, or in other words an underground cellar? A simple basement or underground cellar covered entirely with earth, or perhaps, with something else over the top, for the storage of apples and such commodities?

Professor Blair: I have had very little experience with such a structure, except in so far as our experiments with cellars under dwellings and barns are concerned. The experiment station built three distinct structures; one in southern Illinois, one at Champaign, and the other at Princeton. The further north we go the more successful that structure is, and I see no reason why, in Wisconsin, where the temperature of the earth does not rise as it does in southern and central Illinois, that should not be practicable.

Mr. Irving Smith: I speak of this because I know of one small building that is not actually underground, but is made of timber and covered with sawdust, mill sawdust. It has no roof over it other than the sawdust, no shingle roof at all to keep water out. The building is about 12x14 inside and about 5½ feet high, and in that building apples keep remarkably well. I was talking with the owner a little while ago, and he says he has kept apples and potatoes in that cellar when potatoes in an ordinary house cellar sprouted badly, and you had to look pretty sharp to see the eyes started in the potatoes kept in that underground cellar. The cellar has no floor except the ground.

Mr. J. J. Menn: Have you noticed whether fruit will keep better in an open or in a tight package?

Professor Blair: We have kept fruit in this structure in various ways; some in boxes, some in baskets and some in barrels. We thought fruit in a tight package kept a little better. It does not go down so rapidly in a tight package. If it is absolutely tight the center of the barrel would become decayed before it became thoroughly chilled. I have noticed summer apples put in barrels and it took some little time for the cold to penetrate. I don't think, however, there is so very much difference.

Mr. J. J. Menn: At St. Louis some of the boxes were covered with white mold. How do you account for that?

Professor Blair: That had penetrated through the barrel staves. I noticed that a good deal of barrel stock had been cut from lumber which we call "dotty" lumber, and when that went into cold storage, or moist atmosphere the mold began to grow, and as soon as that penetrates the apple barrel it injures the apple so it soon goes to pieces.

Mr. Menn: There were some boxes of that kind where the apples were wrapped in tissue and waxed paper.

Professor Blair: The temperature could not have been low enough. In a temperature of 31 degrees there would be no growth of that character. In a temperature of 36, possibly of 35, you get some fungous development. I have seen apples go down in a temperature of 38 degrees.

Mr. H. B. Hotchkiss: Have you had any experience in keeping strawberries by refrigeration?

Professor Blair: No.

Mr. Hotchkiss: Do you know whether such fruit would fall down quicker than fruit not kept in extreme cold storage?

Professor Blair: It probably would.

Mr. W. S. Hager: What would be the proper temperature for keeping fall apples in cold storage?

Professor Blair: It should be kept at a temperature of 33 degrees; 32 would be better.

Mr. Irving Smith: What is the lowest temperature that can be maintained with ice

Professor Blair: After a thorough canvass of the situation I found this to be true:—Before we built the structure it was said by the best authorities that we could not get a temperature lower than 35 degrees, but we built this structure and maintained a temperature of 33 degrees. You see in that structure we had one hundred tons of ice, and as soon as it got down to twenty tons we would ice again,and that is the cheapest way, keep your house well iced all the time. This last structure I showed you will require but eight and one-half tons of ice. If this is iced every four weeks during the year it will hold it all right even in central Illinois. It will require from sixty to seventy tons during the year.

Mr. Irving Smith: How often do you have to ice the big one?

Professor Blair: That depends entirely upon the amount of fruit there is in it and upon the season.

Mr. Irving Smith: Well, I mean working it hard?

Professor Blair: The most we have consumed in that house was the 2nd year. I said we consumed sixty tons the first year between the 5th of October and the 23rd of April. Last year it consumed about 120 because we iced earlier and carried fruit longer.

Mr. Irving Smith: How many times did you fill the ice chest?

Professor Blair: Four times.

Mr. W. A. Toole: I have a neighbor who says in order to make a success of this matter it is positively necessary to gather the fruit in the cool of the morning and on cool days and keep all the fruit that is gathered as cool as possible up to the time it is put in the refrigerator. What bearing has that?

Professor Blair: Simply this, that you take it in the morning and the fruit is already chilled to a point very many degrees below what it is at 11 or 12 o'clock. You take it at that late time of the day and wrap the heat up in it and it takes some little time to get that heat out again. Just what is really going on there we hardly know, but if we can take fruit in the morning when it is cool and place it in storage without allowing it to heat up, it will keep much better. Just how much better, there have been no careful experiments to determine. The experience of people who have exhibited fruit seems to tend in that direction, and the result must be found in some such answer, that where fruit has become heated along about noonday and then put in the refrigerator it has not kept so well. But if you take fruit already cold and chill it still more, it would seem reasonable to suppose that it would keep better.

Mr. A. J. Philips: I have been interested in the matter of cold storage for some time, and last week I was down to Ft. Atkinson in Governor Hoard's office. A letter came to him inquiring what people were doing in regard to cold storage, and he gave me a letter which came in answer to that question. I will read to you the letter in answer to that question:

"In regard to the construction of a cold storage house, there is no such thing as building a cheap cold storage house which will produce the most satisfactory results. A large number of fruit growers and dairymen have had experience with the old ice room and its shortcomings, have expressed a preference for the brine system which has a multiplicity of advantages over the ice house. The cost of construction of a plant to hold a thousand barrels of fruit would be $2,500. We charge for plans, iron pipe and galvanized iron work, a complete equipment, from $750 to $850. (I take it that is added to the $2,500.) It would seem this cost should not be excessive, and in good localities the cost of this plant would be saved in from two to five years, depending on the fruit yield and the market conditions."

Professor Blair: I think that is rather a bold statement, and I would like to ask on what the writer bases his statement.

Mr. Philips: This is a letter written by the Cooper system.

Mr. Jos. Reek: I suppose the gentlemen have a patent on the construction of the building.

Professor Blair: Those are the people who are answering this letter?

Mr. Philips: Yes, this is in answer to a letter written to them.

Professor Blair: In all our work, we have zealously avoided discussion which would stir up ill feeling among manufacturers of any material. I can see how the brine system itself could be installed for much less than $2,500. I have looked into it and have studied it, but I am not prepared to make a statement. There is no doubt about mechanical refrigeration, but when you get it down to a business proposition to refrigerate rooms at different temperatures and hold those rooms continually at the same temperature, the only thing to do is to operate what we call a mechanical refrigerating plant. It is a business enterprise and they can afford to put in an engine and run the machinery, but it is not within reason to think the farmer or fruit grower will do that sort of thing. If he can, all the better. I don't know why a community of fruit growers might not construct a plant on that plan. The manufacturers have said repeatedly that ice storage was a failure. I know it is not, and you do not need to take these experiments to find out whether it is or not, but you can go all over the country and find well constructed, cheap, convenient and thoroughly efficient cold storage houses.

Mr. J. J. Menn: Must fruit be perfectly free from dew or rain before being packed for storage purposes?

Professor Blair: I should say it would be better.

The President: Speaking of picking it in the morning, you cannot pick three or four hundred bushels in the morning; if you did it would be wet lots of times.

WILD FLOWERS OF NORTHERN WISCONSIN.

By Eva Loope.

When Dame Nature distributed her flowers she gave to the Badger State a goodly portion. Something she gave to every locality, while upon the state as a whole, she bestowed a variety of wealth and beauty unsurpassed anywhere.

The pleasure of a walk in her woods or fields is enhanced a hundred fold by some little knowledge of the flowers which we meet at every turn. Their names alone serve as a clew to their history, giving us that sense of companionship with our surroundings which is so necessary to the full enjoyment of out door life. But if we have never studied botany it is no easy matter to learn their names, for we find the very people who have always lived among flowers are often ignorant of even their common names and frequently increase our confusion by naming them incorrectly.

I hope you may all have a bowing acquaintance with the flowers I shall name here. Such an acquaintance that will cause the monotony of a drive through an ordinarily uninteresting country to be forgotten in the diversion of noting the way side flowers and counting many different species where formerly only a few would be detected.

Those who love Nature can never be dull, provided, that love be expressed by an intelligent interest rather than by a purely sentimental rapture.

From the day in which the first bare spots appear on the low lands, and the späthe of the unattractive skunk cabbage is seen forcing its way sunward, until late in May, when the meadows are one great flower garden and the glint of bright blossoms is to be seen in the woods, spring has its peculiar delights for him who is interested in flowers.

One of the first flowers we find in our northern woods in early spring, pushing its way to the light through a mass of dead leaves, is the trailing arbutus whose small, pink, waxy blossoms and delicious breath are among the earliest prophecies of perfume-laden summer. Appearing as they do so early they win from us the gladdest recognition of the year. Then comes the blue or purple hepatica or liverwort, wrapped in its fuzzy furs as if to protect its stems and nodding buds from the cold. The anemone next appears with its delicately tinted blossoms. The greenish-yellow bellwort, hanging like a palate from the roof of a mouth, modestly hides behind the leaf of its foot stalk. The blue spring daisy, or Robin's Plantain, with its yellow eye and purple fringe, and the trillium, one of the most beautiful of our wild flowers, next appear. By the rule of three do all the trilliums, as the name implies, regulate their affairs. The wild geranium, or crane's bill, and yellow star grass now appear in our meadows. Further on we find the shooting star, or American Cowslip, with its white, yellow tipped cone.

Among the rich woods in the early spring we find the blood root and mandrake with their immaculate blossoms. Then the violet that has established itself in the hearts of the people from the Arctic to the Gulf, as no sweet-scented, showy, hot house flower has ever done. Royal in color as well as in lavish profusion it blossoms every where—in woods, meadows, way-sides and marshes. Now comes the wood daffodil and Adder Tongue, and the wild Columbine, dancing in its red and yellow petticoats to the rhythm of the breeze. The phlox with its bright purplish pink solitary blossoms blooms in profusion. As if to offer opportunities of comparison to the confused novice, the true Solomon Seal and the so-called false species—quite as honest a plant—usually grow near each other. The flowers of the false Solomon Seal are white and grow in pretty starry clusters at the tip of the stem while those of the true Solomon Seal depend in clusters from the axils of the leaves.

All this time Jack-in-the-pulpit has been standing right under foot and we should have passed him by if a sunbeam had not suddenly lighted upon him making a perfect halo about his head. He looks so jaunty and "fetching" in his dark, handsome suit that you'd never suspect him of hiding a most villainous, hard, white root called Indian turnip. If the Indians habitually ate turnips of this variety it is no wonder they have such atrocious tempers. I have taken a taste of it. You may take my word for it, it doesn't kill but it makes you feel like killing the one who urged you to taste it. Yonder the long bright clusters of the Wild Lupine and the yellow blooms of the hoary puccoon are very noticeable on many of our sandy fields. The pea-like blooms of the lupine serve to identify it as it paints a whole hillside with its vivid blue. Just as many members of the lily tribe shows a preference for the rule of three in the arrangements of its parts, so the wild rose clings to its five petals and five sepals in its native state. The bright pink blossoms, after a while, fade to almost white when exposed to the direct rays of the sun.

Go with me, now, down by the old bayou. The magnet that impels me to seek this beautiful spot are the wild flowers that abound here.

Along the old fence and under the waving blossoms of the stately sunflowers and brown-eyed Susans, sometimes called ox-eyed daisy, the tangled shrubbery hides many modest flowers whose beauty would blush unseen were it not for the occasional intrusion of the flower lover.

With their roots deep in the mud, the arrow heads flourish and with their fragile, wax-like blossoms bow and wave with the movements of the water. Over the bank may be seen the orange yellow blossoms of the Jewel weed or touch-me-not, hanging like jewels from a lady's ear. Familiar as we may be with the nervous little seed pods of the touch-me-not, which children love to pop and see the seeds fly, as they do from the balsam pods in grandmother's garden, they will startle with the suddenness of the volley.

Descending into the swamp we find patches of the blue vervain or simpler's joy, which seem to give the air a lavender tint. Its long spikes being crowded with tiny blue flowers. Now comes a strip where the marsh pink, or bitter bloom, asserts itself and with its five bright petals and starry center delight the eye. The bright yellow Marsh Marigold, growing among its shiny green leaves attracts us to its side. Floating among the lily pads on the surface of the water is found the sumptuous queen of our native aquatic plants, the white water lily. How many have bent their heads in adoration of this pure, golden hearted flower!

Comparisons were ever odious. Just because the yellow water lily has the misfortune to claim relationship with this sweet-scented white species it will never receive its just meed of praise. In the marsh the blue blossoms of the Fluer-de-lis, or Iris, deck its green flags. In both form and color this is the most regal of our wild flowers and it is easy to understand why the Fluer-de-lis was chosen as the emblem of the royal house.

On the edge of the marshy ground borne on tall, erect, leafy spikes, the great lobelia rears its purple shoots, and growing in the grass further along may be found the Water Arum, or Marsh Calla. At a glance one knows this beautiful denizon of the northern bogs and ditches to be a poor relation of the stately calla of our green houses. But it is in the heart of the swamp that the real treasures are to be discovered. If it be early summer, the purplish-red side saddle flower of the pitcher plant grows in lavish profusion. Here we find one of our earliest orchids, the Moccasin Flower, or Yellow Lady Slipper, with its fragrant, solitary bloom. On the uplands the Indian's pipe, or ghost flower, rears its waxy spectral stalk, and the blazing stars and Marguerites live in neighborly communion. In late summer the wild coryopsis, which I think is a new comer in this section of the state, covers the landscape with its branching stalks which suggest the golden candlesticks of sacred story. It is most prolific on the edge of the swamps, and no more attractive picture can be seen than a tamarack swamp with a border of the orange colored blossoms of the coryopsis surrounding it.

And now the spring blossoms are fading away and we find that old Dame Nature has been placing here and there flowers of the richest and most attractive coloring. Let us note some of them. In July the tall Meadow Lily is conspicuous with its yellow and orange red blossoms, and occasionally the Indian Warrior is to be seen with its brilliant red plume bending in the breeze. Another rich treasure that comes later, is the purple pink flowers of the common milkweed. Like dandelion, thistle and other triumphant strugglers for survival, the milkweed sends its offsprings adrift in the winds to found fresh colonies afar. The next beauty is goldenrod, the golden haired daughter of Autumn. Growing close beside the goldenrod is the beautiful wild purple aster. One beauty has deigned to grace October fields. This is the fringed gentain

"Whose sweet and quiet eye
Looks through its fringe to the sky,
Blue, blue, as if that sky let fall
A flower from its cerulean wall."

Another plant which attracts our attention is the Pokeweed. The purple berries of the Pokeweed are far more beautiful than the tiny white blossoms which appear earlier in the summer. The statement has been made that this plant took its name from President Polk. This is doubtful, but the followers of

President Polk used to wear this flower during the political campaign for his election.

The Witch Hazel is, perhaps, the last of autumn flowers. Someone has said that this late comer of the vegetable world deserves the "booby prize."

"Thou waitest late, and com'st alone
When woods are bare and birds have flown;
The frosts and shortening days portend,
The aged year is near its end."

The Composite flowers are the chief heralds of the midsummer flower pageant, and leaders of this procession, along every Autumn roadside, linger to give the Wild Flowers final farewell. It may surprise some to learn that this Composite family ranks in the Plant World as does Man in the Animal World—the highest and last. It includes many species of herbs, shrubs and a few trees and is well distributed all over the world. Some of the most common in Wisconsin will include the iron weed, boneset, aster, goldenrod, sunflowers, sneeze weed, bur-marigold, yarrow, tansies, ragweeds, burdocks, thistles, and dandelions.

There are few who realize what a diversified flora Northern Wisconsin possesses. Within my own county where there is upland, marsh and woodland may be found during the spring months upwards of thirty varieties of the most attractive spring flowers; while in the late summer and autumn, a score or more varieties of the reds and yellows can be counted during an hour's drive in any direction.

One need not have scientific knowledge of wild flowers to enjoy them. The scientist, it is true, has a decided advantage over the non-scientific observer of wild flowers, for to the former is revealed much of the beauty that must remain a secret to the other, but all may enjoy them.

It matters not how old, nor how preoccupied one may be with the work of bread winning, profit and pleasure may be derived from a study of wild flowers.

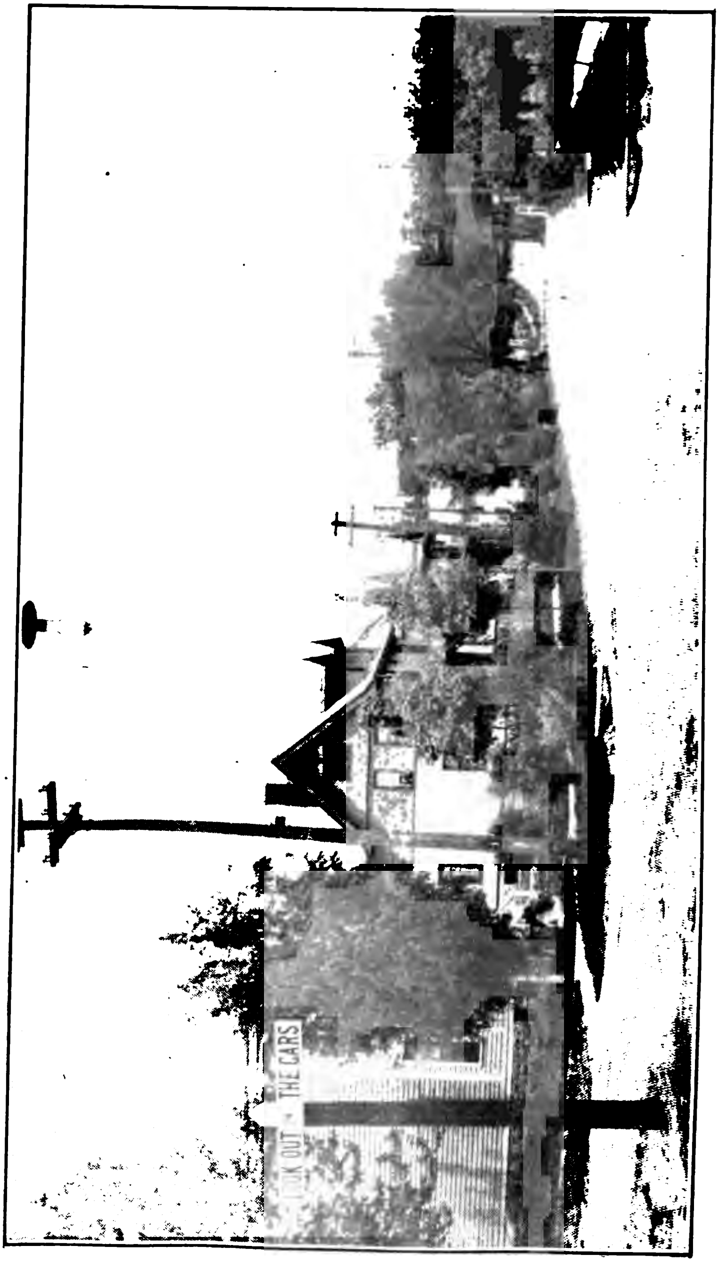
An interest in them cultivates in the young the habit of observation, and is a pleasure-giving resource to the old. Every child (because of the wholesome influence in its after life) should be encouraged to learn names and habits of those flowers with which he comes in daily contact.

I know of no better way to do this than by helping him make a wild wood corner somewhere near the house. This work you need not do all in one year, but make a beginning now. When the work is once commenced it is surprising how many varieties of wild flowers you will discover in the course of a year.

We have in Wisconsin a great variety of wild plants and shrubs, and with these there is a constant bloom from early spring time until late fall. Many of our wild flowers are fast disappearing. Then why not secure them for your wild wood corner? Give them their natural soil and position and your wild bed will increase in beauty every year.

Can you think of any place where the young children would so delight to make their play houses as under the shade of some tree which skirted this bit of wild wood, and as they grow older, how they will study to improve the grounds by making mounds of stones and grottoes where ferns and climbing vines will delight to grow?

You will find that this place will ever be a source of increasing delight to your growing boy and girl for this bit of wild wood will increase in beauty every year; and, perhaps, the love of are and nature, will be so inbred in the boy that he will save the money which some of his friends spend for cigars, perhaps for liquor, also, and add to the attraction of his wildwood a small fountain, supplied from the elevated wind mill tank. Thus through this wild wood corner lessons of nature with love of home and love of country, will be taught quite as effectively as by burning firecrackers or the noise of gun powder. The duties of life may take young men and maidens from the old home, but these sacred childhood memories will never be forgotten, and the visits to the old home will be more frequent by reason of the "Wild wood Corner."



A BLOCK ON BRUEN ST., MADISON, WIS., SHOWING HOW THE STRIP BETWEEN CURB AND SIDEWALK MAY BE UTILIZED.

MEMORIAL ADDRESS.

BY IRVING SMITH.

JAMES S. STICKNEY, WAUWATOSA, WIS.

Mr. President, Ladies and Gentlemen:

In considering the life and work of our departed friend and brother, J. S. Stickney, we have brought before us one of God's noblest sons.

His early life was spent on his father's farm at Lebanon, New Hampshire, in the beautiful Connecticut valley, where he was born on August 8th, 1825. The routine of the farm had but little attraction for him. He seemed to want something with more of growth and development and so in 1848, with his young wife, and in company with Mr. Aaron Loveland, he started west to seek his fortune. Arriving at the little town of Milwaukee they walked out through Wauwatosa to Waukesha looking for a place to settle. After looking around for several days they came back to Wauwatosa and there located. A general nursery business was started and conducted by them for a number of years, when the co-partnership was dissolved and in 1861 Mr. Wm. von Baumbach became associated with Mr. Stickney in his nursery business. During the next ten years the firm entered into various nursery ventures at Waupun, Wis., and at Hamilton, Ill., at the same time keeping up the Wauwatosa nursery. At one time Mr. Stickney was very much interested in evergreens and began the propagation of them from seed, being the first in Wisconsin to work on that line. The firm enjoyed a varied degree of success in its business until in 1871 the Milwaukee Pickle Co. was organized and the nursery was gradually closed out and more attention given to the pickle business. In 1874 Mr. Stickney bought out the other members of the Pickle Co., and with his son, conducted the business.

In this as in the nursery, Mr. Stickney sought to better the condition of the farmers. They were afraid of the cucumber contract and so Mr. Stickney showed them by actual crops and figures of cost and production that there was a good profit in it for the grower. After this, he had no further difficulty in securing cucumber contracts; and had the satisfaction of seeing the business grow to use 40,000 bushels in a season; besides the product of 80 to 100 acres of cauliflower, and sundry other smaller items.

As Milwaukee began to reach out and the business men of the city sought homes apart from the noise and dirt of the city, Wauwatosa became the home of a large and increasing number of prosperous people, with the result that property rapidly advanced in value. Mr. Stickney took advantage of the opportunity and sold quite largely of his holding at prices far in excess of what the land was worth to grow cucumbers on, with the outcome, that he was a rich man. In the meantime the pickle factory had been doing a good business and growing to meet the demands of an ever increasing trade. But, you say, this is a horticultural meeting, what did he do to advance the interests of fruit growing? Well—we find him identified with the State Horticultural Society in 1867 and for a number of years he was active in its work, serving as President for three terms, 1872-3-4, when Mr. A. G. Tuttle succeeded him.

Shall we come together in a memorial service only to hear that Mr. Stickney ran a nursery, a pickle factory, and became a rich man? Nay, verily, we must look elsewhere for true nobility. We sometimes call men great who produce some new grape or apple; but while, in our Society records we find Mr. Stickney's name on the committee on seedlings, we never hear his name mentioned as having produced any thing new. He grew currants very successfully for a number of years; and had some quite novel ideas on growing Hyslop Crabs. He planned on selling on the Chicago market. But had his orchard fenced so if there was no show for profit there, he could turn in a large drove of hogs to harvest the crop.

But we can not ascribe these things to nobility of character. Where shall we find it? Inquire of him, and you are not told; look upon the records of the city of his choice, and you have small reward; seek among the pages of the books of public charity, and still you are not informed; study our own reports, and yet you find not; lay bare all available written records, and you are still but little enlightened. We will seek yet farther, we will go into his home, we will see the man as he is, we will delve deep into his home life, we will ask of his neighbors, we will look into the face of nature about him, aye more, we will live with him, and lo, the veil is lifted. As "The Heavens declare the glory of God; and the firmaments showeth his handiwork," so the face of nature, the homes of his neighbors, his home, and his home life, declare the nobility of Mr. Stickney.

His wife who struggled through the years of hardship when first they came west, became blind during her later life; and for ten year Mr. Stickney cared for her as tenderly as any loving mother for her sick babe, putting into her life all the light possible, while God's sun was shut out from sight.

About five years after her death, he married again, and found in this wife also a most devoted and loving companion and helpmate; and one who brought back to him in his declining years, all the tender care and devotion he had bestowed on his blind wife.

He made his home beautiful with trees and flowers, and wanted every one else to have a beautiful home. While in the nursery business he spread the country for miles around with trees, shrubs and plants. There is hardly a farmer around but looks with pride upon, and lovingly cares for some memorial of Mr. Stickney. You admire a beautiful tree,—yes, Mr. Stickney brought that here and told me how to plant it. You note some bright peony or flowering shrub only to find that Mr. Stickney presented it to his friend. Your eye is caught by the beauty of some border which enlivens the front of the place and inspires the owner to keep the rest up to harmonize with its beauty, and again there comes the oft repeated story, Mr. Stickney gave me those plants. Likewise, many times some good fairy has filled the empty coal bin of the poor and unfortunate; when, if we could but see the Angel of Mercy, we should find her reporting at Mr. Stickney's desk.

Friends, have we not here one whom we may call noble? Indeed, one of God's very elect—a member of no church, because the churches were too narrow and selfish to hold one so broad and unselfish. A man who sought the good of others in all his movements. In selecting his business he wanted that in which he could do the most for his neighbors, in which he could pay the largest possible amounts to those about him. To his hospitality and devotion to his friends there seemed to be no limit, other than their ability or willingness to receive.

As a sympathetic councilor and friend in times of trial, he was just as ready to hear and discuss as though your troubles were his own. On a pleasure trip, he seemed never to be satisfied except he could share it with some one who could not otherwise have taken a vacation.

He went deer hunting once, and showed several fine deer which the party got; then, turning away with pity in his voice and manner, he said, "The worst of it is, we left two or three wounded ones in the woods to suffer." The thought of the poor suffering animals left without help seemed to destroy all satisfaction or pleasure of the trip.

Mr. Stickney's last years were years of increasing feebleness of body, until he was finally obliged to lie down, only to rise in that glorious home beyond. During all this time, when friends inquired as to how he felt; his invariable reply was "Happy." He passed away September 10th, 1904.

Friends, let us not mourn, let us rather, thank God for the grand and noble life among us; which, though, "As absent in body, but present in Spirit," inspires us to nobler lives and higher ambitions. Let us rejoice that his name is written in the Book of Life. "And God shall wipe away all tears from their eyes; and there shall be no more death, neither sorrow, nor crying, neither shall there be any more pain; for the former things are passed away."

Dr. Loope: I will say in connection with this service that I received notice of Mr. Stickney's death through a telegram. I should have been very glad to attend the funeral, but it was impossible for me to do so, and I immediately telephoned to L. G. Kellogg and urged him to go, and I believe Mr. Kellogg did go in my place. Our time is short, but I think it would be well for us to hear from some of the associates of the friend who has passed away a few words, and I will call upon Brother George Kellogg.

Mr. Geo. J. Kellogg: For about fifty years I knew this honorable man, and I have never known anything of him but what was of the highest order of nobility, both in business dealings and in social intercourse. While he was not affiliated with any church, he surpassed in my estimation more than three-fourths of those who profess to be church members. I admire and adore almost his manly thoughts. I think Mr. Smith did not enlarge upon his generosity in the distribution of carloads and carloads of evergreens, but they stand as a monument to his memory along the railroads for miles and miles. He dug them and loaded them on cars if they would only take them and plant them.

I visited Mr. Stickney in his home, and everything that Mr. Smith has said about his home life I can endorse. He paid him a very high tribute.

I will not detain you any longer, but we have lost a good man and no one can take his place. His son takes his place in business, but his sympathies are not in the direction of our work, he has no business connections that would lead him to associate with us. He is a pattern of his father, a noble man, but he is not in our line of work and we do not get the benefit of his association. We shall never find the equal of J. S. Stickney.

Mr. A. J. Philips: Mr. President, I can endorse all that has been said of J. S. Stickney. I have records taken from the *Wisconsin Farmer* that say that J. S. Stickney, George J. Kellogg, George Tuttle and Henry Floyd were at the meeting in 1856 in Janesville at the birth of this Society, and I was very glad that you called on Brother Kellogg, because what I have known of the two men I knew that a very close friendship existed between these two men during all these years. After Mr.

Stickney got so he took no active part in business he would come over in his horse and carriage from Wauwatosa and take Mr. Kellogg home overnight with him to have a visit and talk over old times. As he would go away he would say, "Perhaps I will come over again tomorrow night." It was an honor to go there and stay overnight with him, and after he had a stroke of paralysis and was unable to come over, I think for two years on alternate nights I went over and spent the night with Mr. Stickney.

Mr. Kellogg says you might take three-fourths of the church members and you would not find them leading such consistent lives as Mr. Stickney, and I would be almost tempted to include the other quarter. When my children were small I was living on the farm and it was a question whether my fruit was ever going to pay, and I said to him one day, "What do you think of it?" He gave me some advice, and it was a pleasure to receive advice from him, he said, "With this family of children you have you stay on this farm; if it does not pay you in money it will pay you in health and the enjoyment of the children on the farm." I took that advice and tried to live up to it and I have never regretted it. When he got up on the floor to speak every one was quiet, no one criticized anything he said; we felt it came from a higher power, and that splendid tribute we heard about Prof. Goff (I wish we had it on record so that his son might read it) might with equal force be applied to Mr. Stickney. They were both rare men. I thank you.

Mr. William Toole: We who have associated with our departed friend in a horticultural way in years past feel that we can scarcely let the opportunity go by without adding a word to the noble tribute which has been paid to his character. We were prepared for his going, and yet we can hardly realize that he is no longer with us. When we had him with us he was an inspiration and those who were acquainted with him recognized him as a friend and brother. He did what he could for the betterment of his fellowmen and we felt that he was a friend we could rely upon.

Mr. W. J. Moyle: I was only a young member of this Society, but I knew Mr. Stickney well. It was a pleasure to do business with him. To do business with him was to like him. I was only a young chap and I visited a large marsh in our country and I found some cranberries growing there. I thought it would be a fine idea to go into the cranberry business. I found that Mr. Stickney was an authority and I wrote to him and asked his advice about going into the cranberry business. Mr. Stickney was away from home at the time, but the week after a letter arrived in which he apologized for his delay in answering. You remember Mr. Stickney was in the cranberry business, he had cranberry plants for sale, and yet he advised me not to go into the cranberry business. Ordinarily a man in his position would say I should go right ahead and he would furnish the plants and he had no doubt I would make a success of the business. Mr. Stickney wrote to me something like this: "My dear Moyle: Yours is at hand and I beg pardon for the delay in answering, but I have been away from home. I am aware that cranberries grow wild in the vicinity you speak of, but I am also acquainted with the condition of the soil in that county, and my opinion is that you might make cranberry growing successful to a certain extent, yet you would find after you grew your first crop of cranberries they would cost you at least a dollar a quart." That was the kind of reply he gave me. He knew it would not pay me and told me so, and I have always had more respect for the man.

OBITUARY.

A. N. SEYMOUR.

Part of funeral address by Rev. William Crawford.

Asa N. Seymour died at his home in this village Thursday evening, January 14, 1904.

Asa Noble Seymour was born in Granville, Mass., November 28, 1824, and was 79 years, 1 month, and 16 days old when he died. What his early home and juvenile associations were,

PART III.

Reports of Local Societies and Delegates.

REPORT OF ALGOMA HORTICULTURAL SOCIETY.

Mr. M. V. Sperbeck.

Algoma Horticultural Society holds it monthly meetings on the second Tuesday of each month, with a good attendance, generally. Our membership for the past year has been somewhat reduced.

Owing to a disagreement as to paying dues, a year ago quite a number of our members deserted us, and have remained away for the full year; but on the arrival of our annual meeting, they returned, paid their dues, and we will hope, continue with us in the good work. For verily there was more rejoicing over the few that returned "than over the ninety-and-nine that went not astray."

Besides these we have enrolled quite a number of entirely new members; and with our past experience, and our present condition, we look forward to greater prosperity than we have yet known. We have a balance of $15.50 in the treasury, and advance hall rent paid for three months.

We feel that many members have gained much in horticulture, and that the important work of this Society, and consequent results, have been the incentive, to a great degree.

It has been our custom to give what we term our "Annual Dinner," and this is generally in March, at which time we until 1873, and again from January, 1884, till 1887, and he was a Trustee of the Church and Society for many years.

Deacon Seymour was a man of mild, even temper, of tender feelings, of charitable impulses, of unswerving rectitude—a man exact in his habits, careful in his speech, just in his judgments, and faithful in the discharge of his duties. What he did, he did well. His garden was always in the best of order, and his work in it was done in the proper season. If there was a better gardener in this region, I do not know who it was, His berries and vegetables were the best in the market, and they were as good at the bottom as at the top, and the measure was just. He met his obligations punctually when they became due. Exactness, promptitude, justness, fidelity—these were his traits.

"feed the multitude" as we have the largest turnout and jolliest meeting of the year.

June, the month of roses and strawberries, is not far behind, and at our June meeting we had a fine display of flowers and fruits in connection with the festival.

At our August meeting we had report from our delegate to Summer State Meeting. Mrs. Ihrig gave a very interesting account of her trip and the work done by the State Society.

At our September meeting we held in connection, a flower, vegetable and fruit show, at which Coe, Converse and Edwards of Fort Atkinson, made a fine showing of perennial phlox, etc.

In November we departed from our usual custom, and held our meeting at the residence of D. D. Howlett, where Mrs. H. had a fine display of chrysanthemums, and at this meeting we had a very large attendance. The January meeting is our annual election of officers. The following were elected for the year of 1905:

President—M. E. Henry.

Vice President—Andrew Hanson.

Secretary—Mrs. S. L. Smith.

Treasurer—C. Phillipson.

Members of executive board—D. D. Howlett, Herman Christiansen, Lester J. Athearn, Marcia H. Howlett.

A statement in the "Agriculturalist" though true was very misleading. Although we have a few members from Oshkosh, and there are no restrictions as to place of residence. The place where we hold our meetings is at Algoma Grange Hall, situated three miles from the city, and one mile from the Omro interurban line. A few of the city people only on rare occasions join us except a very small number in the suburbs, immediately adjoining our town.

Mrs. D. D. Howlett, Secretary Algoma Horticultural Society for 1904. R. F. D. No. 5, Oshkosh, Wisconsin.

CHINESE LILAC, SYRINGA *VILLOSA*.

A sturdy symmetrical bush and a very free bloomer. Does not sucker. Hardy at Madison.

CHRYSANTHEMUMS

As exhibited at the Algoma Horticultural Society at residence of Mrs. D. D. Howlett.

REPORT OF OMRO SOCIETY.

Mrs. Jos. D. Treleven.

To the President and Members of the Wisconsin State Horticultural Society:

The Omro Horticultural Society would respectfully submit the following report for the past year:

Our Society has held 12 regular meetings, one strawberry social, and one ice cream social.

In November the Society held their Eleventh Annual Chrysanthemum Show and Fair, which was one of the best in the history of the Society. On January 28 of this year we held a banquet for members and families with an attendance of over 200. We were privileged to have in attendance our President, Dr. T. E. Loope, and Mr. A. J. Phillips, and both gentlemen gave good talks on Horticulture, more particularly apple growing.

The attendance at our regular meeting is good. These meetings are held at the homes of the members the second Friday of each month. Our membership of over 100 embraces the famililes of those interested in Horticulture and Agriculture.

At the Annual Meeting, held January 13, 1905, the following officers were elected:

President—Mrs. Jos. D. Treleven.
Vice President—Henry Ross.
Secretary—W. P. Bussey.
Treasurer—Mrs. Chas. Oaks.
Delegate to Winter Meeting—Jos. D. Treleven.
Alternate Delegate to Winter Meeting—Chas. Oaks.

Our Society extends to all an invitation to meet with us at any of our regular meetings, and should we hold another Chrysanthemum Show and Fair this year, your attendance will be appreciated.

Thanking the State Society for the courtesies shown us, we ain

The Omro Horticultural Society,
W. P. BUSSEY,
Secretary.

eb. 1, 1905.

A GLIMPSE OF THE OMRO CHIRSANTHEMUM SHOW, NOVEMBER, 1904.

FOLIAGE PLANTS AT OMRO CHRYSANTHEMUM SHOW.

REPORT OF THE WAUPACA COUNTY HORTICULTURAL SOCIETY AND IMPROVEMENT ASSOCIATION OF WAUPACA, WISCONSIN.

Our membership consists of about 50 families. Our annual dues are 25c per family. We elect officers once each year. The President appoints a committee, each of three members, on programme and entertainment. We aim to hold meetings once every month. We always have a picnic supper, and hold the meetings in various places. Our usual attendance is from 50 to 150; sometimes over 200.

We generally discuss those subjects pertaining to horticulture, floriculture, gardening, and home making, and a special feature of our next meeting will be the subject of good road making. Politics and religion are not discussed at our meetings.

We always have music and some essays from the younger members and school children, and if you were to attend any of our meetings you would know where some of our future members of our state Society are coming from. We always aim to have at least one topic presented by outsiders at every meeting, and our old friend, A. J. Phillips, favored us with his genial presence and a long and interesting talk on "Seedling Apples" at our last meeting. He, of course, gave Waupaca county the credit of being the banner county of the United States for originating choice seedling apples. And we want to add that our fame has just begun, and we hope to produce the world beaters in the near future.

Horticulture, floriculture, gardening, home decoration, and park and lawn planting are receiving great attention. We need a greenhouse, market garden, a larger apiary, and a fish hatchery at Waupaca to complete our industries, and more domestic and farm help to make us happy.

Our Society extends a cordial invitation to the State Society to hold its next annual meeting at our beautiful chain of lakes, assuring you all a cordial greeting, pleasant time, and inspiring object lessons.

A. D. BARNES, President,
W. H. HOLMS, Secretary,
A. D. BARNES, Delegate.

Waupaca, Wis., February 6, 1905.

REPORT OF LA CROSSE COUNTY AGRICULTURAL, HORTICULTURAL AND DAIRY ASSOCIATION.

Mr. President, Ladies and Gentlemen:

Not only have I helped to distribute, but often have I read with pleasure many of the valuable papers that are issued from year to year in the report of the proceedings of the State Horticultural Society, the fruits of which can be seen from the humble home by the hill side to the broad fertile fields of this our state of Wisconsin.

Coming as I do from among the hills and valleys of La Crosse county with its bluffs rising hundreds of feet above the level of the sea almost on every side. Bounded on the west by that great Father of Waters known through the length and breadth of our land, namely the Mississippi. Upon its banks is situated what is called by many, one of the most beautiful cities of Wisconsin, known as La Crosse, with a population of something over 30,000, and yet I am not here to try and describe either the city or the beautiful scenery that surrounds it.

Often have I heard it remarked, and it is nothing to be wondered at from those coming from a prairie country, at first sight to visit us, would often say—How can these farmers build such fine houses and barns and seemingly do so well with these rough farms? But after looking around they found the farms were not all so hilly, and those that are, were used to the best advantage for pasture and timber.

Four miles from the city of La Crosse is situated the town hall of the town of Campbell, and there upon the second

Wednesday of each month during the winter season, and sometimes a midsummer meeting is held, of the La Crosse County Agricultural, Horticultural, and Dairy Association. So you can readily see we take in all classes, including, almost at every meeting, some of the guests from the city, who often take part in our program; and during the past fifteen years, perhaps, some of the best speakers in the state have addressed us upon different subjects, and considered it a pleasure to have the invitation to do so.

Our Society consists of, as many others do, a president, vice-president, secretary and treasurer. But these alone cannot make our Society a success, but with an able, careful executive committee, consisting of five members, who assist in preparing a program that is usually read at each meeting, stating the subject or part each one is to take in the next meeting.

Quite often at most of our meetings, can be seen the old pioneer, whose locks may be turning somewhat gray, yet through years of experience has learned many lessons of usefulness upon different subjects that cannot help but be a benefit to others. Our program, as a rule, varies from the dairy cow to the growing of the beautiful roses, and at each meeting our ladies and children are not forgotten, even if it is simply to give a recitation or read a piece of their own selcetion and during the past few years, in order that the younger members might take part in our meeting, usually our annual meeting in January, except the election of officers, not many papers are read pertaining to the farm. But instead an address is given by some good speaker,, recitations by some elocutionist, papers on the home or the raising of fruit and flowers, with plently of music both vocal and instrumental, which often goes a long woy to help in the success of the meeting.

And now a few words with regard to our lady friends and members; without them our meetings would soon be a failure. They not only keep the social part of the Society lively, but come with well filled baskets and prepare the dinner, at which all sit down, not only to do justice to it but to spend a social hour with that of our fellow farmer; and here the gardner, for we are surrounded with them, the small fruit grower, and the more extensive farmer sit side by side.

Some may ask about how many members we have, and from whence did our Society originate. To the first question I can not exactly say, perhaps from sixty to one hundred, yet often many more are there, whose names may not be upon the secretary's book. It originated, no doubt, in the days of the Grange, some twenty years ago, when one was required to give the sign, and pass-word, and the correct raps at the door to gain admittance. I can not say but what at that time it was a good order but it seemed to shut out many a good farmer; therefore in our part of the state it soon outlived its life of usefulness. Our Society today is open to the world, as I believe all farmers' societies ought to be.

Our pass-word is "Welcome;" pay 25c, ladies free, and you become a member. Our motto "United we stand, divided we fall," although written on our walls many years ago, and time has erased a part of it, yet it is still our motto, and today we are ready to do what we can to assist this or any other society that has for its teachings the uplifting of one of the noblest callings upon the earth, that of the farmer.

H. T. RICHMOND.

REPORT OF RUSHFORD SOCIETY.

To the officers and members of the Wisconsin State Horticultural Society,

Ladies and Gentlemen:

It is with the kindliest greetings that we offer the annual report of the Rushford Horticultural and Improvement Society, and thinking it might prove of interest to know where we are located, we will premise by saying that, of course, you all know where reigns the Metropolitan Queen of the Historic Fox, which glories in the Aboriginal name of Oshkosh, whose limits encompasses a numerous population possessed of many and divers lingos, from the unpronounceable Russian to the unspeakable Turk. Well close to the limits of the city on the west, appears as a member of the Algoma Society, the genus

Horticulturist; six miles to the west this Society strikes hands fraternal with the Omro Association; six miles farther west we find the Rushford Association doing business six miles farther west to the Winnebago county line. These three organizations draw their support from citizens of contiguous towns who are interested in the work we wish accomplished, and a more wide-awake, intelligent, hospitable, and congenial nest of "horticultural cranks" does not abide within the confines of Wisconsin. As an evidence of the likings of our valley folks for horticultural societies we will obesrve that five out of the eight reports received last year were from Fox river associations.

The Rushford Society's efforts are up to its former records, its interest within the scope of its action does not abate, and in our peculiar lines we feel that we have accomplished much.

Our meetings are free to all, and with an abundance of social sunshine for our corner stone, we make all visitors welcome. Our regular meetings are held the first Saturday of each month. The past year we held twelve, and one special. In June we had a strawberry show and festival; later we had a very fine aster show with fruits of the season. During the seasons' sessions we have exhibits of all varieties of flowers, plants, fruits and novelties at all meetings.

Special efforts were made by our members to represent this section at the Louisiana Purchase Exhibition, and with gratifying results.

Our membership is seventy, and all endeavor to aid in parts assigned them. As our ladies form an integral part of our organization, through their efforts we are always assured fine flower shows, excellent programs of entertainment, and the most appetizing of bounteous banquets.

As a live society that deeply appreciates the benefactions arising from horticultural efforts, we would suggest that some way be devised whereby our tribe might increase.

Another matter: it is evident to all intelligent fruit growers that the nomenclature of Wisconsin apples is in a condition of "confusion confounded." The present generation do not know the true name of half the apples they raise. Seedling varieties come to the front yearly. Many that seem of merit are given old names, the same that our ancestors gave to apples of a far different character; others are given fantastic, local, and irrational names. Cannot our State Society originate a systematic method to obviate such incongruities. We think a Wisconsin Bureau of Nomenclature would help us intelligently through the maze.

Our officers for 1905 are: President, Dr. T. E. Loope; 1st Vice-President, Mrs. S. Timon; 2d. Vice-President, Mrs. I. E. Becker; Treasurer, Mrs. M. E. Peroniman; Recording and Corresponding Secretary, H. H. G. Bradt; Assistant Secretary, Mrs. Mae L. Bradt; Executive Committee, President, 1st Vice-President and Secretary; delegate to State Convention, H. H. G. Bradt; alternate, J. F. Diley.

Respectfully presented,
H. H. G. BRADT, Secretary.

Eureka, Wisconsin, February 4th, 1905.

REPORT OF THE BROWN COUNTY HORTICULTURAL AND AGRICULTURAL SOCIETY.

At the annual meeting held January 28th, Isaac Dickey was elected President; A. Spuhler, Vice-President; Frank Desnoyers, Secretary; and Andrew Reis, Treasurer.

Owing to bad weather and untoward circumstances no social meetings were held last year. But we are not dead,—simply a heavy sleep.

We will hold a Fair at Green Bay this season, which we expect will be as successful as those of the past.

W. S. HAGER, Delegate.

REPORT OF EAU CLAIRE HORTICULTURAL SOCIETY.

Mr. H. B. Hotchkiss.

Mr. President, on behalf of the Eau Claire Society I wish to say that I have no written report, but I can give a brief verbal report of what we are doing. We organized our fruit growers' association in 1902, and we started I think with twelve or thirteen members. I thought then we had all the fruit growers in that community, but at the present time we find we have a very small percentage of them. We now have 126 members of the Fruit Growers' Association. We are incorporated under the laws of the state, our capital stock is small, our membership fee is two dollars, and some of us are beginning to feel that our membership is too small and that we should increase the fee to give us a working fund. There are a great many things that come up in the association that require careful consideration, and the question of giving us a better working fund will undoubtedly be brought before the association. We elected our officers the fore part of this month. The president is Mr. C. L. Richardson, vice president, D. L. Harrison and Franklin O. Keefe, secretary-treasurer. We have members that belong to our association that live at Chippewa Falls, Bloomer and Menomonie. We are spreading out and trying to cover a good deal of territory. We want to control the market in our line of production so that we can establish prices and obtain profitable prices for what we grow.

REPORT OF LAKE MILLS HORTICULTURAL SOCIETY.

Geo. J. Kellogg.

I do not see the delegate from our society here this morning. He is the treasurer, Mr. Fargo, but the trains do not run to suit us and so he is not here. I have no written report and I don't know that our delegate would have if he were here. This report is of the Lake Mills society, and I will say that we held a very successful meeting last June in the strawberry season, we showed a great many varieties, we paid liberal premiums, and we have started quite an interest among the children in growing strawberries. I have a list of over three hundred names on my books of children to whom I gave plants the year before. I exhausted all the funds in the treasury in paying those premiums and next year we cannot offer as many premiums. We had a fair attendance at our meeting and had over forty varieties of strawberries to show. Since June we sent a delegate to Geneva, and we held a meeting last Saturday evening at Library Hall. We have a hall that will seat 200 people, and we had plenty of room to spare. It is the hardest work in the world to get up any interest in that old fruit section. I have been at it six years and if I should leave there would be none left. (Laughter.) We have three hundred children growing strawberries. The people don't come out and we have no authority to send the sheriff after them. We have a large society, but the people don't seem to take hold of the work.

REPORT OF THE MADISON HORTICULTURAL SOCIETY.

H. M. Lewis.

Mr. Chairman, Ladies and Gentlemen:

I have but a few words to say. Some time in 1870 or 1871 we organized the Madison Horticultural Society in this city. The original members of that society are nearly all dead. They were such men as Hon. B. F. Adams, Jos. Hopkins, Richard Leach, and many others. This society did a great work for Madison. We took a great interest in beautifying the town. We had the council pass an ordinance requiring and compelling the setting of shade trees in our streets, and now many parts of our city are grandly shaded with trees. We had an ordinance passed that required the owner of premises to set trees in front of his lot thirty feet apart, and if he did not do it the city did it at his expense and it was assessed with the taxes against his lot. The ladies took great interest in it and were members of our society. We had an exhibit of fruits and flowers annually in the senate chamber which cultivated a taste for flowers in our city community. I think the State Horticultural Society originated with our local society. They were all active in the State Horticultural Society. Mrs. Lewis, at the time of her death, was Secretary of the State Horticultural Society. She had taken a great interest in the building up of the Society, with the other ladies and gentlemen with whom it originated. After her death and those of some other active members it was permitted to lapse, and we have just reorganized. Our active membership fee was two dollars, and there was a good deal of rivalry in the election of officers. The society has now a membership fee of one dollar, and half of that goes to the State Society. It is too small a sum to do anything with. If you put money into anything you feel that you have an interest in it, but if you only put in a few pennies you don't care much about it. We accumulated a fuud and, after spending a good deal of money beautifying our school grounds, we had some four or five hundred dollars remaining in our treasury for a good many years. We had a treasurer who took good care of the money, and now that we have reorganized, I hope we shall do something. I have prepared no speech upon this subject, but there can be no question but that a society like this in every town would be a benefit. Those exhibitions we had became great social centers; people of all classes came to attend them. We had beautiful exhibits of flowers and fruits, and when the exhibition was over the young people had a dance, so they were all interested, and it inspired in the minds of the young people a desire to beautify their surroundings, and the result is that every school house in our city is under the direction of some ladies, whose care is not only that the inside should be ornamented, but that the ground is improved, and they vie with each other as to which school ground in the city shall be best taken care of.

REPORT OF A. J. PHILIPS, FOR THE YEAR 1904 AND 1905 AS DELEGATE AND ATTENDANT AT OTHER SOCIETIES.

First, Minnesota. This Society held its 38th annual meeting beginning December 6, 1904, at Minneapolis. The weather was fine. The program went smoothly without a break. The attendance the first day ranged from 150 to 250 which was well maintained throughout the four days of the meeting. Delegates present were Prof. N. E. Hansen of South Dakota; Prof. A. T. Erwin of Iowa; Mr. J. C. Ferris of Iowa; Rev C. S. Harrison of Nebraska; and the writer who represented Wisconsin. The women's auxiliary had a fine program; the papers and talks being excellent. A liberal attendance of ladies was noticeable at all sessions. The show of fruit was the largest ever made by the Society, consisting of 1,051 plates and 18 pecks of apples. The show of seedlings consisted of 225 plates; western Wisonsin competing in this list. Premiums paid were about $200.00. The Wealthy led with 20 plates and 15 pecks, Pattens Greening 14 plates and 2 pecks, Wolf River 12 plates, and North Western Greenings 11 plates and 1 peck. The Secretary reported a membership of 2,002, which includes 200 life members; said to be the largest society in the United States.

The writer has often been asked how he accounted for this large membership. It is due to several reasons: First, the great harmony prevailing among its members. Second, the placing of the Society upon a business basis by the executive officers. Third, the selection of a capable and energetic man for Secretary, and keeping him in office. Some 12 years ago a move was made to elect an inexperienced young man secretary in place of Mr. Latham, but it failed, and at the next meeting the By-laws and Constitution were changed so that the secretary is chosen by the executive committee, of which two are elected every year, and a man must be a member for 2 years preceding the election to entitle him to a vote.

Mr. Latham at first received $400 a year salary, but since they have been publishing a monthly magazine they have gradually raised his salary as the membership has increased, and he has proved himself worth it until he now receives $1,200 a year. This they think is a business method.

Fourth, the help they receive from the Farmers' Institute workers. Mr. Yahnke alone sending in 235 members last year besides doing his regular Institute work. They have set their mark at 2,500 members the coming year, and it looks as though they would reach it.

Fifth, the great interest they have manifested in the production of new seedling fruits has been a great help and stimulation. This has been pushed by such men as Gideon, Lyman, Harris, Perkins, Elliot, Underwood, Loring, and others.

Four years ago the Society offered a prize of $1,000 for a new winter apple as hardy and productive as Duchess; in quality as good as the Wealthy; and keeping as good as the Malinda. And today I think my friend Yahnke is in the lead of the 40 who have entered for it.

The two seedlings that led at this exhibit were, first, the Evelyn of Wealthy parentage, shown by A. B. Lyman, of Excelsior, and a seedling shown by M. T. E. Perkins of Red Wing, of which the Malinda is the parent.

Sixth, the support given to the Society by members and firms all over the state. Mr. Loring of Minneapolis, now offers a prize of $100 to the person who will originate a native plum better than any they now have; and the Jewell Nursery Co. of Lake City offers a premium of $1,000 for the same thing; and this firm also offers $1,000 for a new cherry, the requirements of which they will soon publish.

Seventh, the growing interest taken in their annual banquet which increases yearly; 129 members participating this year. Mr. Clarence Wedge was toastmaster, which position he filled in a happy manner. Eleven toasts were responded to and several songs thrown in.

Their leading apples seem to be Duchess, Wealthy, Pattens, Greenings, Okabena, and North West Greenings. Of plums, De Soto, Forest Garden, Rolling Stone, Wyant, and Surprise seem to take the lead.

Clarence Wedge was re-elected President without a dissenting vote. L. J. Moyer and John P. Andrews were unanimously elected to succeed themselves on the Executive Board. At 5 o'clock the last day Mrs. Ruth Fillmore sang the hymn, Abide With Me. The President and visitors made a few remarks, and the 38th annual meeting of the Minnesota Society came to a close.

REPORT OF THE THIRTY-NINTH ANNUAL IOWA STATE MEETING.

Held at Des Moines, the Capital of the State, on the 13th, 14th, 15th, and 16th Days of December, 1904.

The meeting opened with an invocation by C. H. True, of Edgewood. The attendance was good. Reports of Secretary and Treasurer show the Society to be in good shape. Our Wisconsin Society by a slight mistake was represented by two delegates, W. J. Moyle and the writer. I gave my usual seedling apple talk ond Mr. Moyle interested them in a creditable way by answering questions on small fruits and flowers, with which he is so very familiar, and in reporting I will leave that part to him. Dust and Liquid Spraying were well discussed but the majority favored the latter method. This state has four district Societies. The North Eastern, the North Western, the South Eastern, and the South Western. They each share with the State Society in state aid; each of the four receiving $200.00 in cash.

The climatic conditions of the northern districts are similar to those of southern Minnesota and Wisconsin. In the southern districts a large amount of peaches are raised and marketed; also many Jonathan and other half hardy varieties of apples. I was surprised to hear that Iowa shipped as many apples as Missouri last year, and that her only competitors in apples at St. Louis were Colorado, Montana, Washington and Oregon; Wisconsin and Minnesota not being mentioned. I was surprised and highly gratified to see on their tables of 800 plates that they brought from St. Louis to show to the people of Des

Moines and their visitors, over 400 plates of Wisconsin and Minnesota seedlings, consisting of 220 plates of nice North West Greenings, 80 plates of very fine Wolf Rivers, 10 plates of Pewaukee, and about the same of Windsor and McMahan.

It seemed to me that the work of A. L. Hatch, Daniels, Springer, Peffer, Plumb, and Freeborn was being appreciated. Gideon was also remembered as 100 plates of Wealthy were in this grand exhibit. My friend Yahnke was the delegate from Minnesota. The horticulturists of Iowa were so well pleased with the work of their able superintendent at St. Louis, Hon. Silas Wilson, that they presented him with a handsome gold watch, as a testimonial, at which over 100 guests were present and Hon. Silas Wilson acted as Toastmaster. A lot of toasts were responded to and many happy and amusing things were said. The senior delegate from Wisconsin toasted Our Neighbors, and the junior delegate complimented the Ladies. One of the pleasing things of the evening was prepared for the occasion by Eugene Secor, Iowa's horticultural poet, entitled A Bit of Green. It was so well received and so apt that I give it in full, for a pattern for our President, who is something of a poet himself.

We stretch our legs beneath the board
With greatest satisfaction
When some one else assumes the bills
That drive men to distraction.
And hence to night these fruit tree cranks
Who turn their own heads chiefly,
Will linger when this gratis grub
Has tickled them too briefly.
Men who have lived on Russian fruits,
And they who eat Ben Davis
Have come to poach on Green's preserves
And get a taste of avis.
Plain Johny cake and apple sauce
And home cooked pork and beans
Will seem like twenty-seven cents
Beside this feast of Greens.
Our appetites like Christmas socks

Were extra large to night;
But Wesley, playing Santa Claus,
Filled everything in sight.
But since we can't prolong this joy
And the time of parting nears,
We'll pray our good and honored guest
May live one thousand years.

Next in order to this Society, the writer was the only delegate from Wisconsin to the annual meeting of the Northeast Iowa Society held at the city of West Union, Dec. 20, 21 and 22, 1904. After the invocation by Mr. True the director from the four districts made their reports, which showed progress along their several lines. Mr. Johnson, a farmer living near West Union, read a paper on the nine best varieties of apples for northern Iowa, which varied but little from those we would select for southern Wisconsin. Professor Hansen was expected but was not present owing to the sudden death of his wife at Brookings, South Dakota. Mr. C. F. Gardner of Osage, read an interesting paper on the Rocky Mountain conifers. Mr. W. A. Aderson, who was selected as a delegate to our Society, read a good paper on plums, and Mr. Patten discussed the red cedar causing rust and scab in our orchards. The conclusion arrived at was that it does not cause rust on the foliage. Mr. Elmer Reeves gave an account of Iowa's fruit show at St. Louis and gave due credit to Minnesota and Wisconsin for the show of seedling apples that originated in those states. The show of fruit was fine, Rev. C. H. True carrying off most of the premiums, the writer acting as one of the judges.

Next, though not a delegate, the writer attended the meeting of the Southern Minnesota Society held at Spring Valley, January 11, 12, and 13, 1905. Mr. O. W. Moore was president and L. P. H. Highby was secretary. The writer gave a paper on the causes and results of the great increase in membership of their parent society. He also gave an illustrated evening talk on the seedling apples of Wisconsin and Minnesota, which was urged to be printed in pamphlet form for distribution. Messrs Patten, Gardner and Bents of Iowa were present, also

President Wedge of Albert Lea and J. C. Hawkins and F. W. Kimball of Austin, Minnesota. The latter is full of enthusiasm for the Society and was elected secretary for the ensuing year. Some years ago the writer attended a meeting at this place and several expressed themselves as unfavorable to that locality ever producing many apples—and to the surprise of all present the figures at the depot there show that fifty-four cars of 180 barrels each were shipped from that station in 1904.

As the writer assisted in organizing the South Dakota Horticultural Society in 1884, and did the same thing for the North Dakota Society in 1904, he was invited by the secretary of that Society to attend this year and give a talk on seedling fruits for Dakota, at their annual meeting at Fargo, January 18, 19 and 20, 1905. This meeting was held in connection with the Tri-State Grain Growers Association, the North Dakota Farmers Institutes and the North Dakota Live Stock Association. This is by far the largest meeting I have attended this winter, the audiences numbering from 800 to 1,500 people, mostly North Dakota farmers. The talk on seedlings and tree planting, together with questions, occupied the most of Friday forenoon, and after the session about 30 put in applications for seeds and trees. It was very gratifying to the writer to find on visiting their fine Agricultural College located on as handsome a section of land as can be seen in Dakota, and meet three or four of the instructors and professors in different departments, such as Dairying, Live Stock, and Physics that are graduates of our Short Course School and University in Wisconsin. It does one who has always taken an interest in our school good to meet and shake hands with those young men who are doing good work in a sister state. They have started their Horticultural Society with a good membership. They selected Professor Waldron secretary, and I predict for them a large strong Society. Four hundred miles is a long distance to go, but the satisfaction, transportation and remuneration I received amply repaid me.

Having been several times invited to attend the meetings of Local Societies at Waupaca and Omro, I concluded to spend a week visiting on my way to this meeting. When their President at the former place, Mr. Barnes, found I was coming he called a meeting for January 27th, which was well attended. I exhibited and gave a talk on our best Wisconsin seedlings, an excellent paper was read by a Baptist preacher entitled "The Religion of Flowers." Their Society seems to be doing a good work in advancing horticulture in the homes of the people. Saturday evening the 28th, the Omro Society, of which Mrs. J. D. Treleven is President, had their annual banquet, at which I discussed seedling apples and other horticultural subjects. President Loope gave a talk and sung in his happy way a couple of songs and though he was lost for a short time in the deep snow on his way home he put in an appearance there again on Monday, and the writer went home with him and enjoyed his hospitality until next day. When I visited ex-President Kellogg at Ripon I found him enjoying the very cold weather by staying pretty close to a good fire. On the way to Madison I sojourned over Sunday with President G. J. Kellogg of the Lake Mills Horticultural Society. He succeeded in getting an interested audience together on Saturday evening, February 4th and I gave them an illustrated seedling talk. It afforded me much pleasure to meet and visit there one of our old workers and members, Mrs. Daniel Huntley, formerly secretary and an earnest worker in the Grand Chute Society of Appleton, which I am sorry to say has now disbanded. Mr. Kellogg has been doing a good work there by giving strawberry plants to over three hundred school children. At Eureka I called on Henry Floyd who is one of the three remaining members who were present at the organization of this State Society. It afforded me pleasure to meet on my trip so many of the workers in this Society. All of which is respectfully submitted.

REPORT OF DELEGATE TO NORTHERN ILLINOIS HORTICULTURAL SOCIETY.

Dr. T. E. Loope.

I wish to say that the Northern Illinois Society asked me to come down there, not knowing me as well as some of you do. I went down there and had a very good time. I did not write a report of my visit and I don't think it is necessary. They have some very good members, but they have no larger attendance than we have when we go to Milwaukee or some other large city. The local feeling was probably just right; the meeting was held at Princeton, the home of the Bryants, and they were in evidence. They had a good display of fruit and they made me feel comfortable all around. We have some of them in our Society meetings quite often. Generally the president comes here. He was re-elected this year, Mr. Thompson. If where you will meet some good people, get the President to appoint you as a delegate to the Northern Illinois Society. I see the Secretary did not mention that I was there; I suppose he didn't think it worth mentioning.

REPORT OF DELEGATE TO IOWA HORTICULTURAL SOCIETY.

Mr. W. J. Moyle.

Mr. President and Members of the Society: I got down to Des Moines all right, but when I got down there I found Father Philips there before me. I was glad of it in many ways, because I look back with pleasure to the first day I came up here to Madison to take the short course, and Mr. Philips was the first man to take hold of me and get me interested in horticulture. When I was introduced to the Society I felt I had someone to back me up if I got in a tight place, and I assure you that at the banquet when we were called upon to respond to toasts, what Mr. Philips did not say I said, and we had a good time. He has covered the ground in his report, but I would like to say that I was greatly pleased with my visit, and I had an opportunity of meeting men there who have a national reputation and whom I never met before. I met Prof. Pammel and he wants to get acquainted with everybody. Then I met Mr. Terry, who is a great plum and peony man, and he has a reputation that is known the world over. He had a paper, but he could not be there to read it himself. I met and talked with a good many of their prominent members, and I also met the secretary, Wesley Green, a fine man, and he has the work of the society very well in hand. Iowa is a large state. Down in the southern part of the state they market peaches by the carload, while in the northern part they cannot grow them. It is a state something like Wisconsin; we can grow in the southern part what they can't grow in the northern. They grow a great assortment of fruit down there, and Mr. Green told me that every part of the state was represented at the meeting. They are pretty well organized the same as they are in Minnesota, and they have one feature there that I thought we might very well take up in Wisconsin. They have an executive committee, and the executive committee elects the other officers, and that means doing away with a great deal of trouble and wire pulling. I think that feature would be a good thing for our members to take under advisement. They had the largest exhibit of fruit they ever had there. They brought up the exhibit they had at St. Louis, a part of it, and put it on exhibition at Des Moines, and they had a good time over the prizes they carried off at St. Louis, but I laughed when I looked over their display and all I could see was the Wolf River and the Northwestern Greening. Then I also had occasion to meet there Silas Wilson. He has retired from business, but he had charge of the Iowa exhibit at St. Louis. I noticed the society is anxious to get the best material in horticultural lines of work in the state. At present they are trying to get Professor Beach as professor of horticulture. The society appropriated $500 of their own funds to get him there, and they think he will come. They spare no money to get the men they want.

This is $500 besides the regular salary he will draw from the state. I want to thank the Society for sending me as a delegate. I know anyone who is selected to go to Iowa will have a good time. I thank you for your attention. (Applause.)

REPORT OF DELEGATE TO ILLINOIS HORTICULTURAL SOCIETY.

C. L. Richardson.

Mr. President, Ladies and Gentlemen of the Society:

Owing to indisposition I was not able to attend the entire meeting of the Illinois Society, so I can only report the impressions I received of such meetings as I attended. Going down on the train, the thing that impressed me most was the remarkable fertility of the country through which we passed. It is certainly some of the finest country that lies out of doors. There was one gentleman in the society who said it was the opinion in the northwestern counties of Illinois that when the Almighty looked upon the earth and blessed it and called upon it to be fruitful, he had one eye upon the northwestern corner of Illinois; and a gentleman from northeastern Illinois, who heard the statement said the eye must have been false, because they believed he had one eye on McHenry county in northeastern Illinois. Perhaps the most interesting paper was one by Professor French on spraying experience in the orchard, for the year 1904. It was the result of state experiment work in 1904 by Professor French at the University of Illinois. To give a summarized statement of the things that impressed me most, I will say that what appealed to me most was the conscientious way in which this work was performed. They informed me they had taken an orchard of five acres and had used 35,247 apples, and counted every apple that fell, those that fell in June and those that dropped earlier, they counted them all and examined them to see whether the injury was done by the apple curculio or the plum curculio. The general results showed that spraying had been thoroughly effective. They sprayed some of the rows of apples three times, some of them seven times, some eight, some thirteen and some sixteen times, and the result showed they had saved about sixty or seventy per cent of the apples by this manner of spraying. In the rows that were not sprayed, about five per cent of the apples were perfect, and in the rows that had been sprayed sixteen times about 62 per cent were perfect, and an examination showed that 80 per cent of the punctures was due to the plum curculio, and 20 per cent to the apple curculio. The professor said spraying alone was not sufficient to do away with the curculio and other pests which infest the apple orchard. Therefore he advocates spraying first, then when the small fruit begins to drop, pick them up, if possible, and lay them out in the light, because he claimed that sunlight is death to the curculio. Even air or a good draft is very deleterious to them. Another thing which he advocated was the cultivation of the orchard during the summer. The question was brought up as to the amount of cultivation that was to be done, and he stated that as a rule it should be cultivated sixty days after the time of blooming. Then as to the habits of the curculio, he showed that when they go down into the ground to finish the pupa stage they normally go to a depth of less than two inches, and if plowing was done to a depth of two inches only it would reach at least ninety per cent of them, and he advocates plowing for a good many things. If you give the land a deep plowing it will put them down so deep in the ground that they will never see daylight. To summarize, he says it is worth while to spray thoroughly, soak the bark, keep the ground cultivated and plow under the curculio. This plowing is of special value in the winter.

Then along the same line of plum curculio in the apple orchard and spraying experiments was a paper by Dr. Forbes. Dr. Forbes' paper was along the same line, but tending to show the successful experiments resulting from such a course. To summarize his statistics: He showed that six sprayings saved an average of thirty-one per cent of the fruit, that eight sprayings saved forty-eight per cent of the fruit, and this was done at a cost of 17 cents per tree during the season. The general opinion of the men down there as to the comparative value of dust or liquid spraying is that they are not very strongly in favor of dust spray, but almost without exception they stated that the dust spray was of so little use as to be of no practical value, and in one test where they sprayed with liquid and with dust, the liquid sprayed trees showed thirty per cent less of curculio and other insects than did those trees sprayed with dust. There was one important exception, and that was with the codling moth; the dust spray seemed to be very effective against the ravages of the codling moth. It was estimated that it prevented ninety per cent of the damage. Another case in which the dust spray was effective was in the case of the Japanese plum. The foliage has a slippery surface and the liquid spray runs off, while the dust spray clings to it and seems to be about as effective as the liquid spray. Dr. Forbes advocated spraying apples late in the season, and also advocated the use of arsenate of lead, and your delegate asked the question if there was not danger, if the season was dry, of poisoning customers, and he admitted there was considerable chance under certain conditions.

Then there was a paper read by Mr. Vaughan, of Chicago, on the subject of floriculture. It was a very able paper, although, perhaps, it was rather over the heads of the majority of members present.

There was also a very fine paper read by Mr. Toole, of Baraboo, on pansy culture. He demonstrated that he thoroughly understood the culture of pansies, and by the unanimous vote of the society he was accorded a vote of thanks for his able paper. Then there was a very valuable suggestion from Mr. Vaughan to the effect that floriculturists, horticulturists and gardeners in general could get more profitable legislation by combining their forces.

Then we were invited to a lecture by Dr. Whitten, of New York. It was a very able address. I did not take notes, and the attempt to write from memory what he said played me false. He opened the address by saying if we would take such care of our orchards as the physician takes of his patients there would be fewer deaths in the orchard; that was the keynote of his address. He showed the weakness of our methods during the summer and said we must expect our trees to be killed during the winter months. He also demonstrated the value of spraying as a protection to the tree. He showed that the weak tree drops its leaves early, and then there is a tendency to start a new growth in the fall, and the tree being in this soft condition is liable to winterkill. It was a very able article on winter killing, as it occurs to me, although I don't think it would have a practical application in this state. Then there was an article on thinning fruit by Mr. Soverhill. He showed it was of value in increasing its size, in improving its texture and in fixing the color, which was a new doctrine to me. The only other article that I might refer to here was on bee keeping. The gentleman showed the advantages of keeping bees in the orchard and strawberry fields is very great.

Before adjournment the delegates were all called upon to respond, and at the close the President of the Illinois Society said, "Now we want you to carry back to your Society the greetings and cordial good fellowship of the Illinois Horticultural Society, and want you to say to them, when they meet this winter, that we admire the work which they have done, and we hope it will be even more successful in the future than it has been in the past," and I said, "Mr. President, I will do so."

PART IV.

Miscellaneous Papers.

MARKETING APPLES WHEN OPPORTUNITY OFFERS.

PREPARED FOR A MEETING OF THE WISCONSIN STATE HORTICULTURAL SOCIETY, BY JAS. HANDLY, QUINCY, ILL.

If we all knew or could recognize the approach of our best opportunities in life, our success would be assured. Many who are in the higher walks enjoying distinction and all comforts and blessings which make life pleasant and desirable, own their positions to the fact that they saw their opportunities and grasped them. On the other hand, the countless number who plainly show disappointment and know what it is to suffer the "flings and arrows of outrageous fortune," can probably tell us the cause of such failure was due to the fact that they did not seize the golden opportunities that were presented and allowed them to pass appreciating their value only when it was too late.

There may be some who never scored a creditable success in any pursuit who may insist that they never had a fair opportunity, that in a careful review of the past they failed to see any occasion that would have given an especial vantage point. Had men of entirely different stamp and mold been in their places under such conditions, they would not have rested until they had made an opportunity.

The subject assigned me, "Marketing Apples When Opportunity Offers," is far reaching and calls for a vast amount of consideration. More could be said on the subject than time would allow in many meetings of horticulturists. In a section of the apple belt near my home in Quincy, Illinois, my attention was once drawn to a case where an apple buyer who was ambitious to buy as many orchards as possible, and to outwit some rival competitors, in one instance, where he was pressed for time bought an orchard in the night. He and the owner of the orchard inspected the trees with lanterns and with no more illumination than could be made by a coal oil wick, conclusions were reached and articles of agreement were signed.

I never took pains to follow up the transaction with the view of ascertaining which got the better of the bargain or whether the sale was mutually satisfactory to buyer and seller. But on the surface of the trade, we all can readily see that this opportunity for marketing apples was exceptionally dark and I think a great risk is run when any trade or business agreement is made in the dark.

In the smallest things pertaining to our welfare I think we need all possible light. If one man is thoroughly posted in buying and the man selling is without the necessary information it would appear that the better posted man would get the best of the contract. On the other hand, if the buyer and seller have the latest and most trust-worthy information as to the condition of the market and crops, the chances are more even.

In such cases if the buyer should be influenced to be too sharp and tempted to drive too close a bargain, he might be like the man who wanted to cure one of his mules of sickness. In the case referred to, the man had a fine pair of mules and one of them was taken severely sick. He did not wish to break a finely matched team, neither did he wish to lose a valuable animal, and, as a consequence, he went to a trusty veterinary doctor. After describing the case the doctor said he was perfectly familiar with the symptoms and that he could furnish medicine warranted to give a speedy cure. He told the man that the medicine was very offensive and under no circumstances should he let the mule taste it until it was lodged in his stomach. In administering the medicine he told him to get a long hollow tube and to place the capsules containing the medicine in the tube and then place one end of the tube in the mule's mouth and stand at the other end and blow the capsule down the mule's throat. Two or three days later the doctor met the man and he was complaining bitterly of a most miserable feeling and the worst case of sickness he ever had in his life, and he told the doctor that the sickness came on when he was treating the mule. The doctor asked, "Did you give the medicine according to directions?" He replied, "Yes, sir, but when I placed the tube and capsule in position, the mule blew first."

The inference drawn from this story can be seen when some very sharp buyer goes out to blow his information in the orchard of a fruit grower, that there may be some occasions when the fruit grower will blow first.

When an apple grower has a well laden orchard for sale it is essentially important that he should have the conditions of orchards not only in his own state, but in every apple producing state in the Union; he certainly should know the condition of the apple orchards in Canada and Nova Scotia, and further, he should know the prospects for a harvest of apples on the other side of the oceans. He then should be governed by the conditions of apples being plentiful in some places and scarce in others, thus having a clearer conception that if the price offered for his orchard is reasonably near its market value, it is quite likely he will consider the price offered less than what the orchard is worth, but in such instances, there are other matters to be considered.

He must realize that he is running some chances of having his trees stripped of their fruit by tornadoes or ruined more or less by hail storms. We all remember the cyclone which destroyed the city of Galveston. Seemingly the tail end of that storm swept up the Mississippi valley, and in a section in which I live, a large number of orchards were despoiled of their fruit. It happened that most of these orchards were sold in a lump before the storm came and in that instance the buyer got decidedly the worst of it.

There are times and places when it is exceedingly difficult to get a sufficient supply of barrels for packing apples when there are large crops and again there is some trouble in finding proper help and the danger of such help making a strike when their services are most needed. All of these things should have serious consideration before a grower would refuse a fair price for his orchard to be taken in a lump.

I think it is one of the best and most admirable features of growing apples when the grower can sell his whole orchard in a lump and get rid of all the risks he may run from storms or strikes or advanced prices in barrels and the general worry of superintending labor and shipments.

Formerly the growers were not always prepared to place a price on an orchard that they wished to sell in a lump, but years of experience has given them clearer comprehensions of the situation and as a rule they generally can make safe trades in this manner. Where they have doubts as to the outcome of the orchard, a very good rule often observed in many places is, to pick the apples from one average limb of the tree, sort them, measuring the No. 1's and No. 2's and culls, and then they can easily approximate the yield of that one tree and if it is a good average the yield of the orchard can be fairly approximated.

Where the grower prefers to sell by barrel and to sort the apples to meet the requirements of the market, it is still imperatively necessary for him to be well informed of the conditions of the crop not only in the United States, but all over the world. And when the price offered is not up to his ideas he must calculate upon the risk of keeping his apples, the expense of cold storage, and all of the incidentals that arise by pursuing such a course.

The information desired, I think, is generally very available. See what a perfect system the International Apple Association maintains. Its forecast of the apple crop every year has been figured out in advance almost to a moral certainty. Its members take such information with confidence and, as a rule, keep on the safe side of their dealings.

Other associations among apple growers are equally forceful and eager and are also competent to give out figures that may be depended upon. Added to this, we are favored with many trust-worthy horticultural journals that take particular pride in holding up lights to the farming community which may be safely followed.

In order to have the information available, I, therefore, would urge all apple growers to belong to some live, wide-awake horticultural association that will look after their interests, and to be regular subscribers to leading horticultural journals and commercial papers which have always proven themselves to be worthy of confidence.

It has been wisely said without faith it is impossible to please God, and I will say further, without faith it is impossible to please men or to do business with them. I would suggest the importance in cases where it is not convenient to attend the meetings of the larger horticultural societies, to form associations even in small communities. By such means they could work to mutual advantage; they could inform each other on the latest report and while they probably would not attempt to form a corner or trust on apples, they, at least, could unite in having an established price that would be satisfactory.

In accepting the condition of marketing apples when opportunity offers, there must in the first place be a strong confidence in the buyer. If the seller has the slightest suspicion that the buyer is coming to beat him out of anything he has, in any way, shape or manner, there will be a reluctance of accepting the opportunity no matter how favorable it may appear on the surface.

I would not be understood as saying that a fruit grower should be forced to accept some of the opportunities. I can see where there would be instances where he would have many opportunities for selling and where not one of the opportunities would be worth considering. But in such cases, he should be master of the situation. He should be competent to think and act if he has a sufficient clear foresight to see that there will be rich rewards, despite of all discouragements for patient waiting, then he can either build his own cold storage house or unite in such a movement with his neighbors.

Such steps should be taken only after careful consideration and with sure confidence that the fruit grower is fully capable of conducting such a business. He must be very conversant with the methods which best preserve the apple and with all facilities for shipping and of obtaining the best rates to most favorable markets.

Such things are not insurmountable by any means and can be readily grasped by the man of good, average intelligence. It would be far better to assert his independence showing he is capable of attending to his own business, rather than to suffer imposition from any combine or unscrupulous buyers.

In order to find the best opportunity for selling apples I would impress the superlative importance of growing the best fruit. Last year instances were cited where apples were rotting in orchards, the owners not seeing sufficient encouragement to pick and market the fruit. It is not necessary to say that such orchards are affected by scab and other diseases and that the fruit was generally of an inferior quality.

On the other hand, instances were cited again where apples of superior quality were selling for $5 to $7 per barrel and buyers were taking them as fast as the opportunity offered. It has been wisely said from a political point of view, that the office should seek the man, not the man the office. It is not necessary to say that the apple market is in a far more wholesome state when the buyer is hunting for the seller instead of the seller making extra efforts to find the buyer. Good, sound, clean, first class fruit will never have to wait long for a buyer. It is wanted.

The golden mean for giving life and vigor to the apple industry would be found in more of a mutual confidence between the grower and buyer. The grower should concede that the buyer is an imperative necessity and he should be willing to recognize the fact that the commission man, the evaporator, vinegar and cider maker, and canner, in fact those who purchase the apple for any purpose whatever, should have opportunity of making reasonable profit for their enterprise, and if it should happen that in some years the commission man, by good judgment and foresight, should get prolific returns from his investments, he should not be envied; it should be borne in mind that all years are not prosperous and that there are plenty of instances beyond the control of any dealer and they cause occasional severe losses and there should be opportunities for recovering, otherwise dealers would be forced out of business.

On the other hand, the buyer should recognize the fact that without the grower it would not be possible for him to do business and he, therefore, should encourage the grower by creating and paying the highest market prices and in using all available means to encourage the grower in his line of industry.

In a paper that, perhaps, has rambled too much at will, I would submit the following summary, which I think could be remembered and acted upon with more or less profit to the grower:

In the first place, the grower should be well posted on the conditions of crops, not only in the United States but in the apple belts of all foreign countries.

He should be thoroughly informed upon the state of the market and the prevailing prices paid at all commercial centers.

He should have clear ideas as to the cost of freight and transportation. Whenever the price offered is unsatisfactory he should carefully consider all chances that would be against him in holding his product for better terms.

He should be assiduous in using all available means to procure this information.

Such information can be found by keeping in close touch with his neighboring horticultural societies and by constantly reading the most reputable and trustworthy horticultural and commercial papers.

Should he determine to place his crop on cold storage he should have the assurance that he is perfectly competent to take care of his fruit and make satisfactory arrangements for shipping in case he does not place such fruit in cold storage houses managed by firms having established reputations.

Inasmuch as it requires foresight to conduct any kind of business successfully, it is essentially important that the keenest foresight should be given on growing the variety and the quality of an apple for which there is an earnest demand.

While recognizing the fact of there being complaints of sharpers and tricksters among the middlemen who try to handle the crops, there is yet and always will be, a goodly number of well established, responsible firms in the country who are ready to handle apples on the fairest terms, and their counsel and good advice should be sought with that confidence which forms the strongest bonds in holding all business interests together and the absence of which in any department of public or private life would leave us all without any place for a footing.

SMALL FRUITS.

C. L. Pearson.

Read at meeting of farmers and fruit growers at Baraboo, March, 1905.

Does it pay to grow small fruits? I will answer by saying that it pays some people some of the time. But those who have been in the business for a number of years will remember that the supply of fruit sometimes exceed the demand and those are the times that make the grower feel as though he had the "grip."

When I have shipped to commission houses at such times and "Pearson, he paid the freight" it was hard to keep up a high degree of enthusiasm for the berry business. It was easier to keep up a high degree of animosity toward the commission man. But I have found that those very low prices might have been partially avoided by a better distribution of the fruit among small towns.

People owning a garden or farm usually find that it pays to grow berries for home use. The family can have more fun with a good berry patch than they can in a circus. Many a person's pleasant recollections of the old homestead center around the fruit and flower garden. Some there are who look back to the old farm with a tired feeling, but they, doubtless, came from one of those cheerless homes where it is cheaper to buy fruit than to grow it.

Where of horticulture they have heard
But seem to hate the very word.
To grow their fruit they do not try,
They claim 'tis cheaper far to buy,
But where berries are in their prime
They're out of cash just at that time.

The first fruit of the season, the first in commercial importance, the first in beauty and the first in the hearts of the people is the strawberry—the glorious old strawberry. It is justly crowned the queen among fruits.

There was trouble in the first garden over apples but the humble strawberry has always been a peace maker, bringing joy to millions of households.

It is not much work to grow strawberries,—I think it is just pure, unadulterated fun.

The strawberry grows in every clime, on all kinds of soil, with most any kind of treatment, but it knows when it is well treated and responds accordingly. It takes good soil mixed with brains to grow big strawberries.

Geo. J. Kellogg, the veteran grower, tells of berries so big that six fill a quart box, and the receipts $1,400 per acre. The best that I have known an acre to do near Baraboo is $526.00; so we have a good climb yet to reach the top of the ladder.

The best time to plant strawberries is in the spring. Good plants of the best varieties are important factors in successful strawberry culture.

Some of the plants of a new variety sold at one dollar per plant, and many of the new kinds, of which there are hundreds, have been decimated at several dollars per dozen, and then the discovery is made that they are not as good as some of the old stand-bys. Some plant growers advertise thoroughbred, pedigree strawberry plants but the plants show that a pedigree will not make a good plant out of a poor one. Always set the best plants you can get but don't pay an extra price for wind.

There are still a few strawberry patches which do nothing but blossom and receive the condemnation from the owner, simply because none of the blossoms are pollen bearing. Be sure that every plantation contains varieties which are pollenizers. If I could have only two varieties I would choose Warfield and Dunlap. If a dozen, I would have Warfield, Dunlap, B. Wood, Haverland, Bisel, Crescent, Glen Mary, Clyde, Bubach, Sample, Aroma, Splendid, and Enhance.

For growing fancy berries, I would set the plants early; let the first runners form a few plants and keep all later runners cut off, making what is called a hedge row. I shall omit cultural direction in detail but wish to emphasize the importance of winter protection; covering the plants the first week in November with oat straw.

The strawberry season can be followed closely with raspberries, both red and black. The London and Cuthbert are good reds. Among the black caps we have tried the Gregg, Ohio, Kansas, Palmer and Older, and consider the Older the best of the lot, as it seldom winter kills and the fruit is large. Good varieties of blackberries are Snyder, Badger and Ancient Britton. Some growers protect the canes by covering with earth in the fall and they get a crop when the other fellows have none.

In conclusion will say, plant a fruit garden and be happy ever after.

THE ASTER.

By Dr. E. Everett.

Read at a meeting of the Madison Horticultural Society, April 15, 1904.

The aster is one of our leading annuals, a flower for the million, one that any can raise in pot or garden. Its distinguishing beauty, that is, its formal appearance, its regularity of flower and foliage, its exactness of outline, rather old-maidish, yet delightful and composing, renders it most popular. Well might the Greek call it Callistephus—a beautiful crown, The development of the aster reminds us of the evolution of the chrysanthemum. It comes to us from China and Japan, through Europe, where it had been introduced by a Jesuit missionary, in 1731. In the early days of navigation, the Jesuits, whose zeal carried them into all lands, brought to us many of our most valued plants, shrubs, ornamental and fruit trees. The flower was single, blue, violet, and white, with two to four rows of ray florets. In 1753 Philip Miller, the famous English botanist, had produced double asters. The aster made its greatest advance in Germany. Breck says that in 1851, had been produced the quilled or high centered aster, so popular in these days. At present these do not meet the popular taste, which demands a nearer approach to the chrysanthemum, such as the comet type, a loose open flower, with long strap-like rays or petals.

Asters cannot be classed by color, habit or stature, as many types have both tall and dwar forms. Vilmorin of France, considered our best authority, makes the varieties into two groups —pyramidal and non-pyramidal.

The aster is beautifully varied as to color—white, pink, pale and deep blue, violet in several tones, purple, crimson, yellow, bright red and solferino. The taste differs in varieties, not all having the same popularity throughout the country with commercial growers or connoiseurs. Those presented in a reliable catalogue are to any fancy. In the garden, or in our home decoration, the shades of the Victoria, comet, triumph, Truffauts perfection, mignon, Semple's branching or Vick's branching-- in masses give gorgeous effects. The Hohenzollern is massive, large, and fine for show beds and exhibitions. This race represents the largest and best curled flowers, wide, long twisted florets, the stems long and strong, and the colors very effective. By some, the ostrich, is considered the best cutting aster, especially in England. The daybreak, a most beautiful shrimp pink, is a great favorite. The giant flowering strains bear large flowers on long stiff stems. I have raised them, three feet long, with flowers, six inches in diameter. However, the size of a flower is not always the chief feature of beauty, for the Truffauts, or peony perfection, is small. It has the incurved petal making a compact head, a ball of decided color, and is of a shapely form.

The aster, like the chrysanthemum, is in great demand as a cut flower. Both take four to five months of care and expense before a single bloom appears. They keep from seven to fourteen days and can be shipped from sea to sea. The aster differs from the chrysanthemum in that it may be grown all out of doors, as well as in its more varied coloring, and longer season of bloom. The highest perfection would be obtained in the aster if it would only give us an exquisite perfume.

THE CULTURE OF ASTERS.

Our best seed is grown in Germany and France, where labor is cheap, and climatic and soil conditions are most favorable. Well filled seed should be selected and sown in shallow boxes, or in the open ground, and in rather light soil. The earth should be pulverized and the rows two to four inches apart. Some authorities advise dusting bone meal in the seed row. The seed should be covered with four times its size of finely pulverized earth, moistened and covered with paper or cheesecloth, and exposed to the light. In three to four weeks they should be transplanted to boxes, cold frames, or, to the open, two to four inches apart, and later to rows one foot apart, and plants nine inches to one foot in the row. The best results come from sowing in the open ground May 25 to June 5. The aster prefers a deep rich soil, one containing a black loam, clay, sand, and well rotted manure; a soil that is friable, and that will endure a dry or wet season, and containing sufficient of lime, nitrogen, phosphoric acid, etc. Mr. Semple, of Semple's branching aster fame, uses guano as a fertilizer two to three weeks after setting out, cultivating until the buds show. At the commencement of bloom, tobacco stems are used for the root lice.

Enemies of the aster are lice on the roots, May or June bugs, beetles feeding on the petals, rust on the leaves, wilt or stem rot, last but not least, the yellow disease or blight.

A louse-affected plant has a wilted unhealthy appearance. It does not die quickly, but remains in this stage all the season.

The roots are found to be one mass of blueish-colored lice in all stages of development. Entomologists know nothing of this pest, and all one can do is to use new, uninfested soil, and treat with strong tobacco water. The May or June bug eats off the roots, and the plant dies at once. By pulling up the plant the bug can be found and detroyed, and often the plant can be reset. Just at daybreak is the best time to find them, and one-half inch below the surface of the ground. They are said to be worse in a dry soil or season, though last year is the only time I have been troubled by them, and that was in soil low and wet. Wilt or stem rot is caused by a fungus that enters the plant near the surface of the ground, and fills up the water vessels of the stem, thus causing the plant to wilt and finally die. It is most noticeable at the time of setting out the plants, and of blooming. . A close examination shows a rotting of the stem at the surface of the ground. This stem rot begins on one side of the plant, usually turning it to a yellowish green, spreading rapidly to the whole plant, with the swiftness of the Egyptian plagues in the time of Moses. It has been proved that the disease is contracted, not after the plants were set out, but in the seed bed, under glass, resulting from conditions of damping off; such as cloudy, wet weather, overwatering, followed by damp, cloudy days. At the Hatch experimental station, of the Agricultuarl College of Massachusetts, the only treatment known is to sow seed in the open ground, where asters have never been raised. This fungus or fusarium is the same as that on melons, cow peas, etc. The beetle is successfully treated by capture on the flower and a kerosene bath. The yellow disease or blight is the one most destructive to the aster. It is caused by no fungus, insect or other organism, and is not effected by any treatment or surroundings. Last year it entirely ruined the aster crop, commercially and otherwise, throughout this country, and to some extent in Europe. The plants become yellowish and spindling, but live on their natural length of life. All succeeding growths on the plant are spindling and yellow. The flower is one sided, short rayed, and a sickly color, though sometimes one-half will have the normal color. Mr. Hatch says that a microscopic examination of stem and leaf shows nothing but a lack of green coloring matter. The roots, even in the most diseased plants, are sound and healthy. In short, it is a condition in which the plant is starved. Extensive trials at the various experimental stations in Washington and elsewhere—sowing the seed of all the varieties of the aster under glass and in the open, in all kinds of soil, using the various fertilizers, or none—all resulting the same—an unknown cause produces this yellow blight, as in "peach yellows," or in the calico in tobacco. It has been found best to procure the most reliable seed, and sow in the open, using ground that has never grown an aster. The soil should be prepared the year previous. Damping off and lice should be fought. Last year my asters affected the most by the blight were on ground never before growing an aster.

PLEA FOR WILD FLOWERS.

I feel like making a plea for the native wild aster, starworts or michelmas daisies, for when we consider that the aster is mostly indigenous to the new world, and therefore comparatively new when compared to the chrysanthemum and carnation, which have received horticultural care for ages, its future usefulness seems assured. There are few classes of plants that afford better material for hybridization; it responds most readily to cultivation. There are some two hundred species, about one hundred and fifty of which are in America. Some species grow in the Himalayas, fifteen thousand feet above the sea. This aster is seen more in our gardens now that an increasing demand is abroad for native perennials or flora. In England, especially, have they been valued for a century or more. There is a quiet beauty about the better varieties; their varying color, form, bud and bloom. They are most decorative for cutting. They and the golden rod are the best known and appreciated of our native flowers, adding greatly to the beauty of our autumn landscapes. Every garden should have a few varieties that do not spread rapidly. I know from sad experience that some varieties will spread all over one's grounds in two or three seasons.

These beautiful, vigorous perennials are generally blueish and white, and most showy in masses, planted in half neglected places, among groups of shrubs and copses. They should not be as high as these surrounding shrubs. Golden rod, mixed in, makes a beautiful autumn effect in the open woods; cosmos in the more exposed places. They require no staking, care, or winter protection, and have no diseases—most valuable considerations. By annually dividing, manuring the ground, and giving plenty of room, their blooming is longer and grander. You maintain a better bloom each succeeding year by not allowing seed to mature. I will mention a few good varieties: A. Longifolius is most showy, growing in the pyramidal form, completely covered with bright, rose-colored flowers, until frost. A. Shortii is tall, and has large blue flowers. Ericoides, white, one of the earliest and prettiest, a great favorite in England. Amelus, variety Bessarabicus (a Russian starwort), one of the best and largest purple species, comes in August and September. Cordifolius; Horizontalis, rosy lilac; Turbanallus, a soft lavender; Grandiflorus, a violet blue; Paniculata; Patens; Tarmicoides, white. The Novae Rubra, bright rose colored. The Novae-Angliae, large blueish-purple, yellow center, is most familiar to us. Every garden should have this grand variety. This aster and Nove Belgii are the best for pot culture, especially the latter, which gives a large flower, and a longer period of bloom. Cuttings and offshoots in the early spring make large plants by autumn; eight to twelve inch pots should be used; their chief care is quantities of water. A most hardy perennial aster is the popular Stokes Blue Cyanae, a native of our southern states, but it had to be introduced from Europe, having been known there since 1764.

A NEW APPLE, GEM CITY.

F. Cranefield.

At the winter meeting of this Society, February, 1905, a premium was offered for "Best new apple named (locally) and in bearing for five years but not on Society fruit list."

Several kinds were offered in competition but the premium was awarded to an apple exhibited by Mrs. Robert Ramsey and

Mr. A. D. Brown both of Baraboo. The apple was entered in both cases under the local name of "Townsend."

This name was formally adopted by the Society by endorsing the following resolution:

"WHEREAS: The variety of apple shown in our fruit exhibit under the name of "Townsend," and sometimes called "Dodgeville" is in the opinion of the judges a variety of unusual promise and likely to be widely disseminated.

"Resolved: That the Wisconsin State Horticultural Society adopt the name of Townsend for this variety."

On looking over Downing's fruit list, it was found that the name Townsend must be abandoned, as an apple by this name has been listed for over a hundred years. Mr. A. D. Brown of Baraboo, who is introducing this apple, on being informed of this, selected the name "Gem City" and notice is hereby given that the apple above mentioned and hereby described and figured is to be known as the "Gem City."

GEM CITY—(TOWNSEND.)

Description.

Size—7 to 8.

Form—Distinctly oblate.

Color—Ground, pale yellow marked with broad stripes of dark red which are broken and irregular. Sunny side and stem end, overspread with veins of dark red. Dots small, numerous, indistinct.

Basin—Broad, medium, smooth.

Stem—short, stout.

Cavity—Broad, shallow, slightly furrowed.

Calyx—Open.

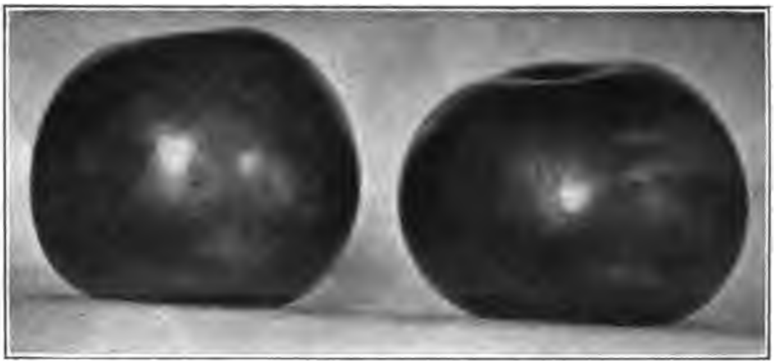
Core—Closed.

Flesh—Very white, crisp, fine grained, slightly acid.

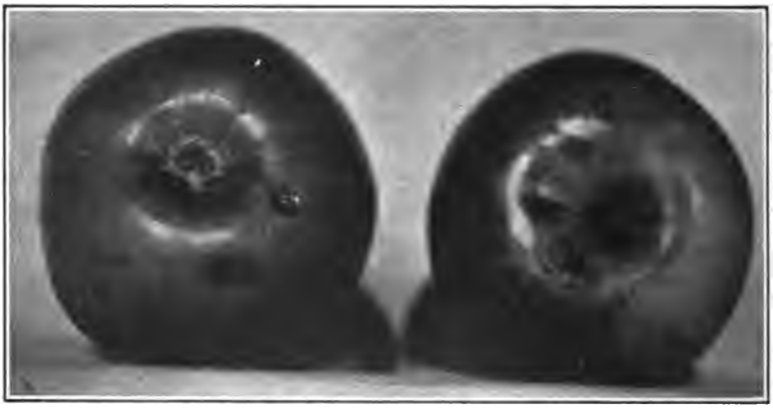
Quality—Good.

Season—Late winter.

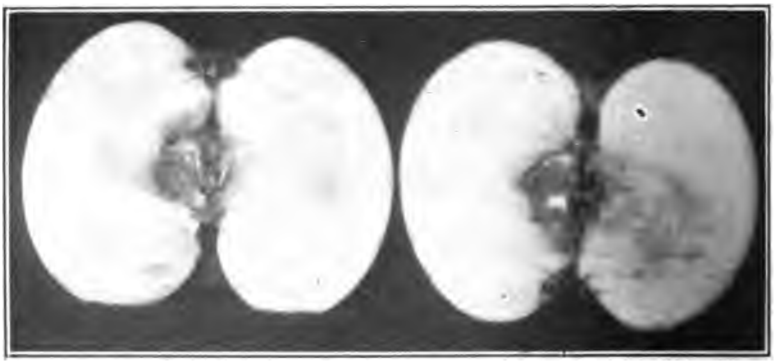
Described, February 17, 1905, from specimen from Mrs. Robert Ramsey, Baraboo, Wis.



GEM CITY APPLE, MUCH REDUCED.



GEM CITY APPLE, END VIEW, MUCH REDUCED.



GEM CITY APPLE, MUCH REDUCED.

HISTORY OF GEM CITY APPLE.

By Wm. Toole, Baraboo.

The original tree of the Gem City (Townsend) apple was a chance seedling which came up close to the house of Mr. Charles Dickinson, now dead, whose farm was near Dodgeville.

The young tree being in the way, was cut down twice, but the third growth was allowed to stay until it had borne fruit. Mr. George Townsend of Baraboo, while visiting with Mr. Dickinson, was much attracted by the fruit, believing that it was a seedling of more than ordinary promise. Mr. Townsend seems to be the only one who realized at that time the possible value of the apple. He procured some scions and eighteen or twenty years ago planted two young trees in his orchard from this grafting. These trees seemed to be as hardy as any of the Russian varieties of which this orchard largely consists. Mr. Townsend distributed young trees of his own grafting to various persons, among them A. D. Brown and Mrs. Robert Ramsey, who exhibited from trees about fifteen years old, the fruit which attracted so much attention at the winter meeting of the Wisconsin State Horticultural Society in Madison, February 9, 1905. Each of these growers speak of it as a better grower than the Fameuse with larger fruit, apparently as hardy as any, an early and good bearer, an all winter keeper of highest quality, and in texture of skin and flesh, appears to be a seedling of the Fameuse.

The foregoing cover the main facts which I can get. No one at Dodgeville seems to feel any interest in the apple and if it had not been for Mr. Townsend, it would have been lost to the world. Mr. A. D. Brown has taken great interest in the apple and takes it up as his specialty, now that Mr. Townsend is gone.

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